Industrial Arts and Vocational Education

The SHOP TEACHERS' PROFESSIONAL MAGAZINE

April, 1953 Vol. 42, No. 4

First step towards . . . what?

These photographs illustrate two steps in an amazing procedure that levitates a lump of metal in air and melts it as it floats. The metal is floated and melted by the magnetic fields from two coils. Primarily for the purpose of abolishing contamination of the metal, this process may lead to as yet undreamed of developments in the future.

Photos courtesy Westinghouse Electric Corporation

The thrust . . . and the awareness

What the aftermath of an amazing development such as that shown above may be no man can tell. For man's mind works by a process of thrust . . . and awareness. Almost naked will probes the darkness of the unknown like a sword and then man becomes aware of what has been brought to light. This is as true of the penetrating perceptions of ancient Greek philosophy as it is of the achievements of an Einstein, of the great thrusts of science and engineering today.

Since this process is so productive . . . *and only it can be productive* . . . surely more men must be brought to awareness of its very existence. That is the first step past mere egotism and self-absorption into the realm where men see, create and *give*, where may be found the enlightenment which alone can bring peace and amity to the world.

Is this too much to propose to educators as substance for their students? Not at all. It is just a question of in which direction native energy, native ambition, native thought, native action will go. Mechanical drafting teaching for example can be completely "mechanical" or it can be shown for what it is . . . first step in creativeness . . . initial move toward giant career . . . first step linking hand and brain . . . a demonstration to the student that *all* originates from within.

At such a point, whether a student shall economize on the purchase of the tools of this discipline becomes an impertinent question. Shall the minor saving so gained in the purchase of the cheap and shoddy be permitted to vitiate perhaps all the educator is trying to do? We think not.

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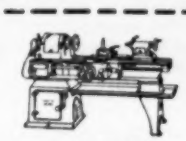
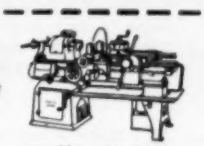
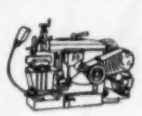

☐ 10" to 16" FLOOR LATHES


☐ ½" and 1" Collet TURRET LATHES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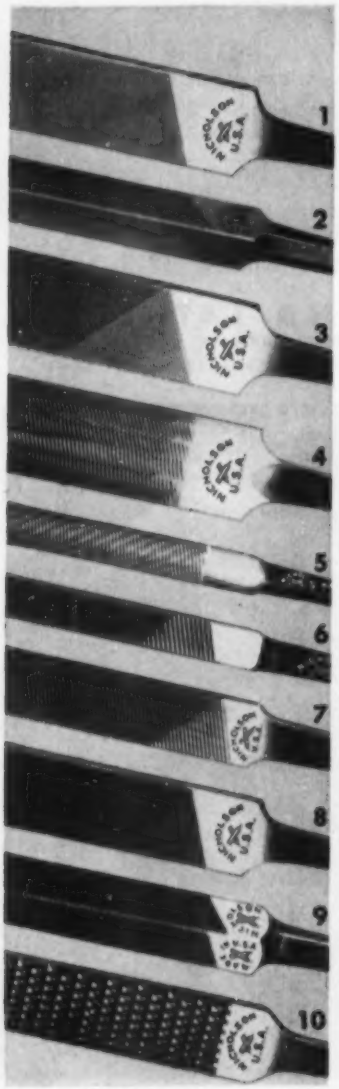

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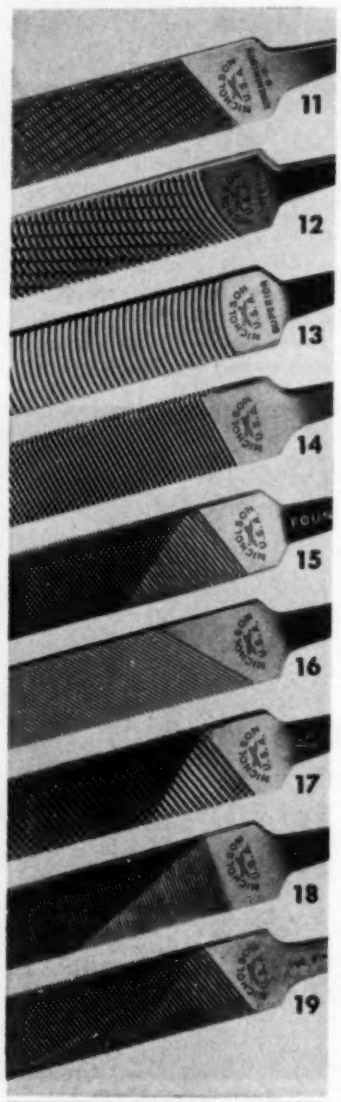

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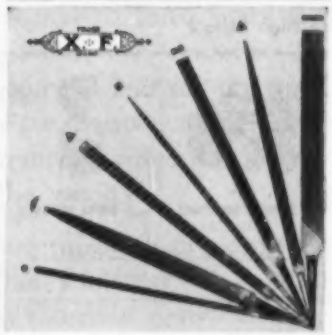

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Vol. 42 No. 4

APRIL, 1953

INDUSTRIAL ARTS *and* VOCATIONAL EDUCATION

THE SHOP TEACHERS' PROFESSIONAL MAGAZINE

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This Month's Cover

The cover picture selected for the April, 1953, issue of INDUSTRIAL ARTS AND VOCATIONAL EDUCATION portrays O. H. Chidester, instructor of printing at the Tucson Senior High School, Tucson, Ariz., showing his students of the Adult Evening School class in printing how to lock up a type form.

The picture was submitted by Harry A. Goldstein, instructor of photography at the high school.

☆ ☆ ☆

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ASSOCIATION NEWS

COMING CONVENTIONS

Apr. 2–4. Washington Industrial Arts Association, at John Rogers High School, Spokane, Wash. Secretary, F. Dale Smith, Director of Industrial Arts, Spokane Public Schools.

Apr. 2–4. Texas Vocational Association, at Texas Hotel, Fort Worth, Tex. President, John Cherry, Supervisor of Industrial Arts, Fort Worth Public Schools.

Apr. 17. Industrial Education Conference, at Memorial Union, Ames, Iowa. Chairman, Lowell L. Carver, 101 Ind. Arts Bldg., Iowa State College, Ames, Iowa.

Apr. 17–18. Connecticut Industrial Arts Association, at Teachers College, New Britain, Conn.

Apr. 17–18. Louisiana Industrial Education Conference, at Northwestern State College, Natchitoches, La. Chairman, Dr. Walter J. Robinson, Northwestern State College, Natchitoches, La.

Apr. 18. Nebraska Industrial Education Association, at Evans Hotel, Columbus, Neb. Secretary, Evan Boiler, 1200 N. 44 St., Lincoln, Neb.

Apr. 23–25. New York State Vocational and Practical Arts Association, at Hotel Statler, New York City. Secretary, R. S. Knouse, N. Y. State College for Teachers, Albany, N. Y.

Apr. 23–25. Indiana Industrial Education Association, at Hammond Civic Center, Hammond, Ind. Secretary, H. G. McComb, State Director of T. & I., 215 State House, Indianapolis, Ind.

Apr. 28–29. American Council of Industrial Arts Supervisors, at Statler Hotel, Detroit, Mich.

Apr. 29. American Council of Industrial Arts Teacher Education, at Statler Hotel, Detroit, Mich.

Apr. 30–May 1. Wisconsin Association for Vocational and Adult Education, at Schroeder Hotel, Milwaukee, Wis. Secretary, C. D. Rejahl, 211 N. Carroll, Madison, Wis.

Apr. 30–May 3. American Industrial Arts Association, at Statler Hotel, Detroit, Mich. Secretary, D. Arthur Bricker, 216 E. 9th St., Cincinnati 2, Ohio.

THE NORTHEASTERN OHIO INDUSTRIAL ARTS TEACHERS ASSOCIATION

The Northeastern Ohio Industrial Arts Teachers Association enjoyed the hospitality of Republic Steel Corporation, Friday evening, February 6, 1953. President Max Lerner of Ashland, Ohio, and Vice-President Ellis Mills of Akron, Ohio, were successful in planning an enlightening trip through the Stainless Steel Division at Massillon, Ohio. One hundred eighteen members witnessed the rolling and polishing of stainless steel.

A fine meal was served in the office employees' dining room. Color movies were shown describing the manufacture of stainless steel which are available for loan by writing to Industrial Relations Department, Republic Steel Corporation, Massillon, Ohio.

The principal speaker and high light of the evening was a talk by C. W. Gehrum, supervisor of industrial training for Central Alloy District of Republic Steel. He outlined the educational program of Republic Steel and expressed the hope that industry and school can continue to work in close harmony. — *Duane E. Work.*

INDUSTRIAL EDUCATION CLUBS OF ILLINOIS

John Warhoover, an O'Fallon Township high school junior, has been elected the first president of the Industrial Education Clubs in the state of Illinois. The honor was bestowed on him by representatives from 14 schools at the constitutional convention held at the Leland Hotel in Springfield, November 21 and 22. John is secretary-treasurer of his own club and a member of the Letterman's Club, in addition to his serving on the staff of the 1953 Panther, the yearbook of his high school.

The idea for the new state-wide organization came at the Illinois Vocational Association convention in Chicago last April. L. B. Sample, industrial education instructor at OTHS, was called there to give the group the benefit of his experience. It was he who organized the O'Fallon club 11 years ago and it now is believed to be the oldest club in the state in continuous operation. His own club members in past years have made excellent improvements about the school. At present they are financing and building a scoreboard for the high school gymnasium and just recently completed building new risers for the band.

The organizational meetings were held at Springfield by a five-man committee consisting of Lowell Burkett of the State Board of Vocational Education who served as chairman; L. B. Sample, O'Fallon; Charles Crites, Matton; Wallace Stevenson, Woodriver; and E. W. Koertge, Litchfield.

The objects of the new organization are to co-ordinate the aims of the individual clubs throughout the state so they may all work toward a common end; to provide opportunities for development of leadership in civic, social, and industrial pursuits; to foster high ideals and appreciations in the dignity of work; to foster a wholesome understanding of the functions of both labor and capital and a recognition of their mutual interdependence; to create a deep interest and esteem for industrial education; to afford opportunities for developing a continued, growing loyalty to the principle of government and wholesome respect for democratic ideals.

The new organization began its existence with 14 charter clubs. The clubs throughout the state and their sponsors are: O'Fallon, L. B. Sample; Belleville, Bill Rapp; Belvidere, Lyle Moss; Mt. Carmel, E. M. Rutledge; Litchfield, Lloyd Perry; Galva, C. E. Whitehouse; Woodriver, M. B. Rotnem; Pana, Wayne Yonkers; Kewanee, Paul McMorris; Robinson, Wm. Musselmann; Kankakee, D. B. Murphy; Paxton, James Smith; East Moline, John Cavenaugh; Matton, Charles Crites. — *L. B. Sample.*

GUIDANCE CONFERENCE AT WINTHROP COLLEGE

Dr. Robert Hoppock, professor of education at New York University, spoke on "Guidance Aspects of Classroom Teaching" during the one-day conference on guidance in education, February 17, at Winthrop College and the Guidance Services of the South Carolina State Department of Education.

He discussed the teacher's role in the school's

(Continued on page 6A)

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ASSOCIATION NEWS

(Continued from page 4A)

program of orientation and the problems of individual differences and failures as they apply to the technique of teaching.

CALIFORNIA INDUSTRIAL EDUCATION ASSOCIATION CONVENTION

The Southern Section of the California Industrial Education Association met in convention at Orange Coast College, Costa Mesa, on Saturday, January 10.

Dr. James Hunter, executive dean, San Diego State College, gave the morning address, "Industrial Education in a Changing World." He challenged the group to meet the changes evident in the world of today with changes in personal behavior and in educational pattern.

Hudson Roysher, industrial design artist and member of the L.A. City College faculty, addressed the afternoon session on "Design, the Plus Factor." Mr. Roysher stressed the necessity of making design an integral, functional part of every project constructed. He asked the audience to develop design in material, not in paper and pencil form alone.

Claude Nihart, Lee Ralston (State CIEA President), and Lyman Goldsmith, retiring CIEA-SS President, inducted the newly elected officers. They are Dave Taxis, president; John Owens, vice-president; John Groebli and Al Rasmussen, representatives at large. — *J. Douglas Wilson.*

PRINTING WEEK AT LOS ANGELES

Printing Week was held in Los Angeles January 11 to 17, commemorating the birth date of Benjamin Franklin. The program was sponsored jointly by the Printing Industries Association, Inc., and the Los Angeles Club of Printing House Craftsmen. Over 50 speakers were used in service organization talks. Many radio and TV programs recognized the printing industries. The week was brought to a close with a banquet at the Statler Hotel with over 600 in attendance.

Three scholarships were given to students from L. A. Trade-Technical Printing Dept., by the Industries Association and the Ladies Auxiliary of the Craftsmen. — *Reaugh Fisher.*

PHI DELTA KAPPA INITIATION

Parker Wilber, Harry Simonds, Ralph Rogers, and J. Douglas Wilson were initiated recently into the U.C.L.A. Phi Delta Kappa Chapter.

THE MASSACHUSETTS INDUSTRIAL EDUCATION SOCIETY

Officers of the Massachusetts Industrial Education Society for this year are: president, Emil E. Keiler, Warren Jr. High School, West Newton; vice-president, Carl A. Olson, Jr., Braintree High School, Braintree; secretary, Leo V. Gittzus, Perkins Institute, Watertown; treasurer, Charles D. Plumb, Boston Technical High School, Boston.

Members appointed to the Executive Board for the current year are: correspondence, John Paltsits, Braintree High School, Braintree; education, James J. Hammond (On Sabbatical Leave), State Teachers College, Fitchburg; library, Edwin L. Frye, Day Jr. High School, Newtonville; membership, Arthur G. Sticklor, Groton High School, Groton; program, Hubert E. Edmonds, Framingham High School, Framingham; publicity, Charles Avadanian, Beebe Jr.

(Continued on page 8A)

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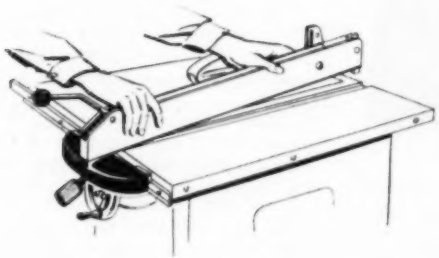

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ASSOCIATION NEWS

(Continued from page 6A)

High School, Malden; research, Charles J. Chiasson, West Jr. High School, Brockton; social, Joseph Rains, Patrick T. Campbell Jr. High, Dorchester; past president, Everett E. Koehler, State Teachers College, Fitchburg.

A regional meeting of the Society is being planned to be held in Stoughton in March for the industrial-arts instructors in that vicinity. Any industrial-arts men, desirous of playing host to instructors in their region, are invited to contact any member of the executive board and assistance will be given in making arrangements. Regional meetings in the past have been held in Framingham, Walpole, Arlington, Weston, and Braintree.

On Saturday, April 11, the 7th Annual Spring Convention will be held in the industrial-arts building of the State Teachers College in Fitchburg. The theme of the convention is "Projects." Industrial-arts teachers throughout the state are being encouraged to select their projects for exhibition at this convention.

A well-known automobile manufacturer is planning to present Awards of Merit to the boys exhibiting well-designed and well-constructed projects. These awards are to be on the junior high school and senior high school levels in woodwork, metalwork, drawing, graphic arts, and arts and crafts. The possibility of a get-together of the awards winners and their industrial-arts instructors is also being dicussed.

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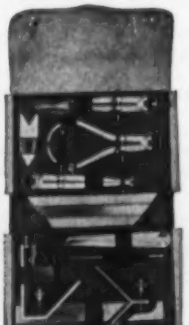

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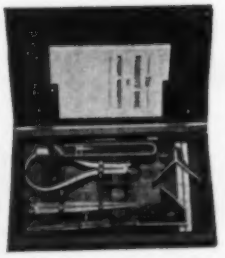
The basic tools at minimum cost. Contains 6" combination square complete, 6" flexible steel rule, center gage, center punch, 4" divider, 4" inside caliper, 4" outside caliper and 4" hermaphrodite caliper. Simulated leather folding case.



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MONTGOMERY COUNTY INDUSTRIAL EDUCATION ASSOCIATION

The Montgomery County Industrial Education Association (Pennsylvania) has held two meetings in 1952. The October meeting consisted of a tour through the modern plant of the Standard Pressed Steel Company of Jenkintown, Pa.

The December meeting featured a project "swap" night and also a very interesting demonstration of silk-screen printing by an expert in that field.

The officers of the organization are: L. W. Kunkle, Philadelphia, president; Walter Krauser, North Wales, vice-president; Charles Shafer, Huntington Valley, treasurer; and Mervyn T. Jones, Norristown, secretary.

SOUTHEASTERN INDUSTRIAL ARTS CONFERENCE

The spring meeting of the Southeastern Industrial Arts Conference will be held at Waukesha, Wis., on Saturday, March 28, 1953.

CALIFORNIA INDUSTRIAL EDUCATION ASSOCIATION AT SANTA BARBARA

The California Industrial Education Association held its annual state convention in Santa Barbara, Calif., on March 20 and 21.

Kermit Seefeld was the convention chairman.

The two-day meeting was built around the theme of "Teaching Techniques."

At the general meeting on Friday morning, Dr. McCormick was the main speaker.

The afternoon session started out at one o'clock with a master teaching demonstration.

At 3:00 p.m. a microwave demonstration was given, and at seven o'clock in the evening the executive meeting was held.

On Saturday, teaching demonstrations in various subject fields occupied the morning.

At noon there was a luncheon meeting, and this was followed by various commercial demonstrations.

After the barbeque at five o'clock there was a general session, at which Dr. Mobley was the principal speaker.

The Ship's program then followed.

SILVER ANNIVERSARY CONVENTION OF THE MICHIGAN INDUSTRIAL EDUCATION SOCIETY

The Michigan Industrial Education Society will hold its silver anniversary convention in Grand Rapids, Mich., on April 16, 17, and 18. The convention headquarters will be in the Pantlind Hotel.

There will be many meetings of particular interest during the three days of the convention. Several divisional meetings have been scheduled in the fields of industrial arts and trade and industry with out-of-state speakers participating who will bring important messages and valuable information. In addition, the commercial and educational exhibits will afford an opportunity to see and examine the latest in equipment and supplies for all areas of industrial education. — *D. R. Sherman.*

OHIO INDUSTRIAL ARTS ASSOCIATION

The Ohio Industrial Arts Association is holding its annual meeting at the Neil House in Columbus on March 26, 27, and 28, 1953. The banquet speaker will be Thomas R. Reid, director of the Office of Civic Affairs, Ford Motor Company. The general theme of the program is "1001 Ideas

(Continued on page 18A)

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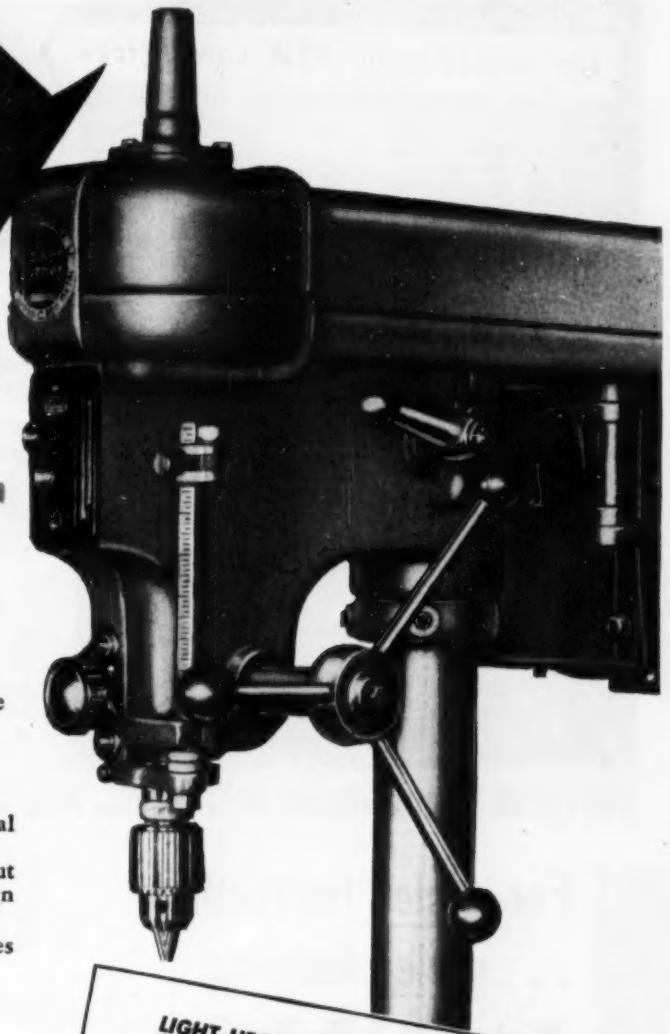

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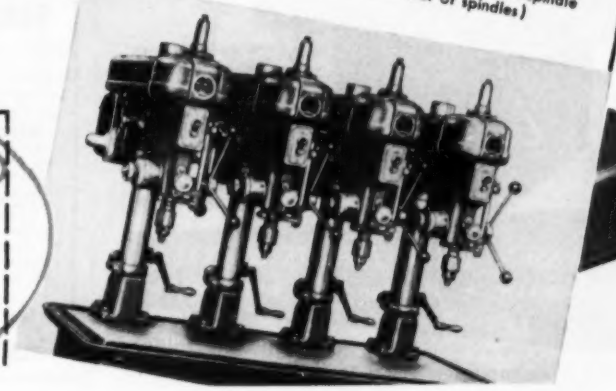

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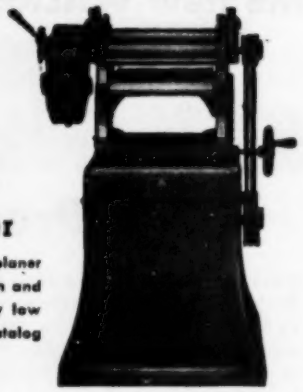

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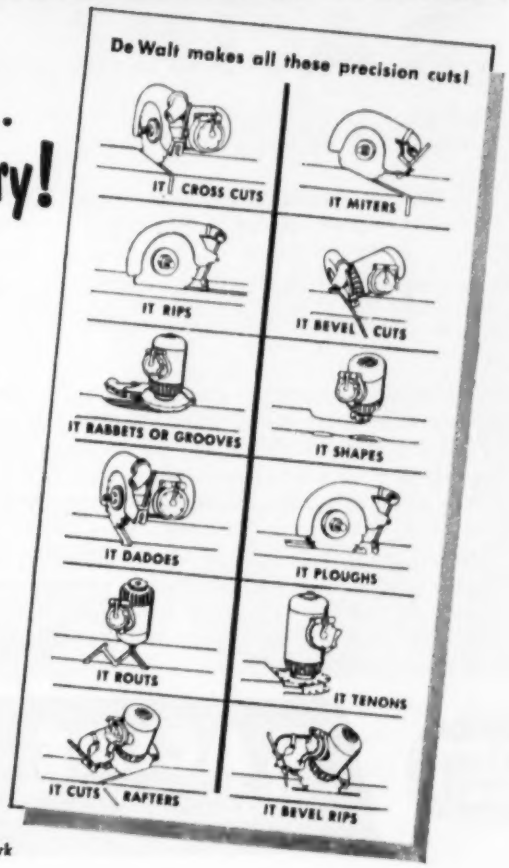

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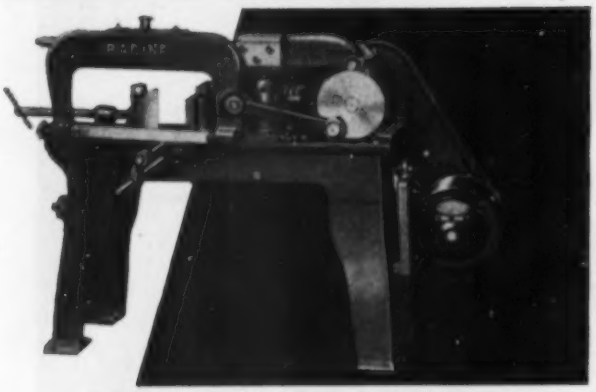

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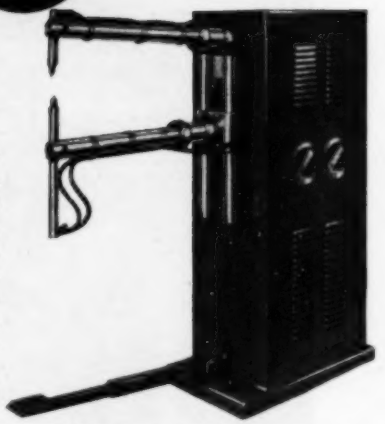

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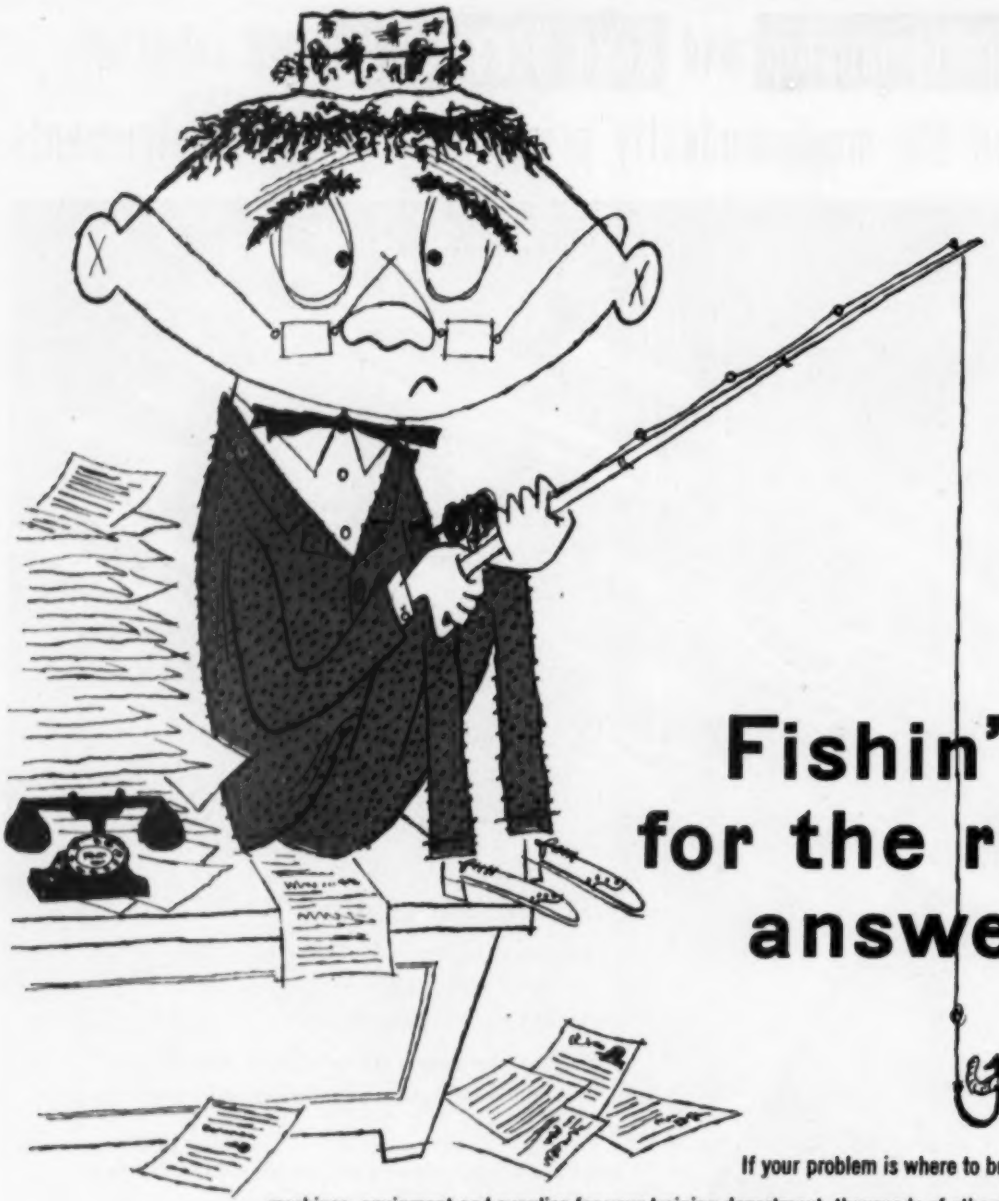

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INDUSTRIAL ARTS *and* VOCATIONAL EDUCATION

APRIL 1953

Ten Year Follow-Up Study of Co-operative Part-Time Pupils

I. G. TERRY

Director, Industrial and Adult Education
Senior High School
Marshalltown, Iowa

In our Co-operative Part Time Training Program, a pupil is put on an actual training job in the community for one half of his school day and he attends regularly scheduled classes at the high school the other half day. Any industrial or business establishment in the community may become a training center if the pupil wants training there, if the co-ordinator approves the place, and if the employer wants to co-operate. Before completing the placement the co-ordinator advises with the student, his school counselor, his parents and the employer. Regular high school vocational credit is given for the work and the co-ordinator regularly supervises the student after the beginning of his employment.

Our vocational education advisory committee is made up of 15 or more employers of the community. A few of the members rotate each year. This committee has met regularly twice each year since its inception during the summer of 1937. The following school year 1937–38, our program was put into operation. A copy of a program announcement for a meeting of this committee on October 24, 1946 follows:

ADVISORY COMMITTEE LUNCHEON
SENIOR HIGH SCHOOL
October 24, 1946 at 12:15
A. J. Hesmer, *Chairman*
C. A. Dunham Co.

K. E. Brintnall Brintnall's Store	Ralph Williams M'town Trowel Co.
S. A. Dickerson J. C. Penney Co.	F. H. Whitcombe Lennox Furnace Co.
Clarence Coulter Mickel Furniture Co.	J. W. Considine M'town Mfg. Co.
Mrs. Lazelle Steffa Kresge Dime Store	R. C. McCague Kiowa Corp.
Calvin Neve Chamber of Commerce	Fred Zeurcher Cooper Mfg. Co.
A. G. Hockridge Lennox Furnace Co.	D. C. Elder Fisher Gov. Co.
W. E. Simmons Safety Bus Lines	George Zeurcher Cooper Mfg. Co.

PROGRAM

Reading of the minutes
Reports on the current year's work
Topic for discussion: "Follow-up"
NOTE: We plan to adjourn at 1:30.

The committee met on the above date at its usual noon luncheon to discuss *follow-up* of our part-time co-operative students who had established themselves permanently in the community. It was recommended that a survey be taken ten years after each co-operative group had been graduated from high school, and that the investigation should include the first five years of the program's operation. Therefore, the groups which were graduated during the years 1938–42 inclusive were included. The survey was begun in the summer of 1948 and was concluded during the summer of 1952.

Following is a description of the aims, procedure, areas covered, and results of this investigation with an attempt to summarize the results.

The principal aim of this study is to determine the value in the minds of these graduates of the Co-operative Training Program as a vocational unit in our high school curriculum. Other minor aims all contributing to this principal aim are to learn:

1. How many of these co-operative graduates remain in our local community.
2. How successful each has been in advancing in his chosen occupation.
3. How much they value the skills developed in the program as applied in their present jobs.
4. How many different occupations they are pursuing in the community.
5. How many are in the same occupational areas for which they were trained.
6. Why they took the course and how they evaluate it as a school subject.
7. Why they took other high school subjects and how they evaluate them.
8. How they think we could have helped them further while they were in high school.

The following questionnaire was worked out to aid in this survey:

SURVEY OF HIGH SCHOOL GRADUATES
of Marshalltown, Iowa

I. *Personal* Date.....
Name..... Address..... Age.....
Year graduated.....Year married.....No. of children.....

II. *Present Employment*
What is your present employment?.....
How long have you been employed here?.....Do you like this work?.....
Why or why not?.....

III. *Work Record* (Evaluation — score 0 to 5)
Year Employment Place Skills developed Evaluation Reason for change

IV. *High School Record*

Subject	*Units*	*Av. Gr.*	*Evaluation*	*Check reasons for taking* 1 2 3 4 5 6 7 8 9 10
English				
Soc. Sci.				
Phys. Sci.				
Math.				
Language				
Ind. Ed.				
Com. Ed.				
Phys. Ed.				

Reasons
1. Citizenship
2. Other advice
3. Advancement
4. Publicity
5. Interest
6. Personality
7. Easy subject
8. Popular teacher
9. Required
10. Education

V. *Vocational Subjects*
Subjects taken.....
Reasons for taking vocational subjects. Check reasons given. Learn trade or business....Finance high school education....Make extra money....Learn about different jobs....Be out of school part time....Less sitting....Less study....

Evaluation of vocational subjects taken. Score each 0–5. Guidance....Human relations....Increased skills....Adjustment to job....Increased observations ....More attention to directions....Increased responsibility....

Suggestions for improvements in vocational work. Check one suggested. More related work....Less related work....More supervision....Less supervision.... More vocational subjects....Less vocational subjects....Others.....

What further help could the school have given you:
In guidance? In training? In follow-up?

We began the survey during the summer of 1948 by locating as many of the co-operative part time graduates for the year 1938 as possible. This information was obtained from relatives, friends, teachers, and classmates of each co-operative graduate. The same procedure was followed for the classes of 1939 to 1942 inclusive. After locating as many of the groups as possible, we listed those living in our community at that time, and set out to contact each of them and arrange for an individual interview. In this conference, we went over the questionnaire slowly and deliberately, giving the interviewee plenty of time to think about and discuss each topic. The aim at all times was to get the unbiased and uninfluenced opinion of the individual. Each conference took approximately two hours. Grades and numbers of units of high school subjects taken were later checked with the school records. The conferences were at all times private with only the interviewee and the interviewer present.

Five general areas were covered in the conference; namely, personal data, present employment, work record, high school record, and the individual's opinion of the part time co-operative work. In the personal area the main points of interest were age, marital status, and size of family. In this area, too, it was usually brought out as to whether the interviewees owned their own homes. In the area of present employment we sought the kind of occupation now held, tenure, and whether they liked or disliked it and why. In the work record, number of places employed, skills learned in each, and the evaluation of these skills were obtained. In the evaluating of the skills, a point scale of 0 to 5 was used. This system is used in all areas in the questionnaire where evaluation is called for. The high school record was investigated to determine the scholastic rating of the individual and to get his opinion of the value of the high school subjects he took in school. In these evaluations, vocational work and industrial arts are included in industrial education. In the last area we wanted the interviewee's opinion confined to the vocational field and especially to the area of co-operative part time training.

Following are the tabulations of the results in all the areas mentioned with brief explanations following each table.

TABLE IA. Personal Data

Number and present location of boys and girls participating in the Co-operative Part-Time Program in Marshalltown High School during the years 1938–42 inclusive.

Year graduated	*No. in Co-op. P.T. Program* *Boys*	*Girls*	*Total*	*Present Location* *Iowa*	*Other states*	*Deceased*	*Unknown*
1938	18	2	20	16	2	0	2
1939	33	3	36	23	8	2	3
1940	28	9	37	24	11	1	1
1941	48	11	59	41	10	2	6
1942	46	10	56	36	10	4	6
Total							
5 Yrs.	173	35	208	140	41	9	18

One hundred seventy-three boys and 35 girls took part in this program during the five years 1938 to 1942. Of this total of 208 at the end of ten years after graduation, 140 or 67.3 per cent lived in Iowa, 41 or 19.7 per cent lived in other states, nine or 4.3 per cent were deceased, and the whereabouts of 18 or 8.7 per cent could not be determined. Of the 140 who lived in Iowa, 111 or 79.3 per cent lived in Marshalltown, and 29 or 20.7 per cent were in other cities in Iowa. The 41 located in other states were scattered from New Jersey to California. Of the nine deceased, one had been killed in an accident and eight had been killed in the armed services.

TABLE IB. Personal Data

Number of boys and girls who participated in the program and who were living in Marshalltown ten years after their graduation from high school, showing also their marital status, average number of children, average age and age range.

Year graduated	*No. taking P.T. Co-op* *Boys*	*Girls*	*Total*	*Marital Status* *Married*	*Single*	*Divorced*	*Average children*	*Average age*	*Age range*
1938	10	2	12	11	1	0	1.3	27.6	27–29
1939	16	2	18	17	1	2	1.0	27.7	27–30
1940	16	4	20	19	1	0	1.0	26.9	26–28
1941	28	5	33	29	4	2	1.0	27.9	26–29
1942	22	6	28	27	1	1	1.2	27.3	26–29
Total	92	19	111	103	8	5	1.1	27.5	26–30

Of the 111 boys and girls who were living in Marshalltown ten years after graduation from high school, 103 or 92.8 per cent had been married and each of them had an average of 1.1 children. Eight or 7.2 per cent had remained single and five or 4.8 per cent had been divorced. Their average age was 27.5 years and the age ranged from 26 to 30 years.

All of this group had established permanent homes in Marshalltown. The great majority owned their own homes. Each of them belonged to some church, club, or other city organization. Several of their

children were attending the local elementary schools.

TABLE II. Present Employment

Year graduated	Occupational areas represented	No. Working in Areas: No. similar to training	No. different from training	Average years in occupation	No. liking work: Yes	No. liking work: No
1938	7	11	1	6	10	2
1939	9	15	3	8	17	1
1940	9	12	8	6	19	1
1941	14	24	9	5	32	1
1942	14	16	12	5	26	2
Total	53	78	33	6	104	7

Table II shows the number of occupational areas in which the people interviewed now work, the number now working in occupations similar to that for which they had been trained in the part-time Co-operative Program while in high school, the years of service in their present occupations, and their liking for their present jobs.

The 111 people now working in the 27 occupational areas were distributed as follows: mechanic 27, housewife 14, machinist 10, clerk 9, carpenter 7, salesman 7, molder 5, farmer 3, newspaperwork 3, draftsman 3, instructor 3, printer 2, meat cutter 2, electrician 2, welder 2, commercial art 1, upholsterer 1, radio 1, painter 1, toolmaker 1, dairyman 1, bookkeeper 1, bricklayer 1, patternmaker 1, lens grinder 1, telephone operator 1, undertaker 1.

Of the 111 interviewed 78 or a little more than 70 per cent were working in the same occupational areas for which they had taken the Co-operative Part-Time Training. Five of the girls were working full time and 9 of the 14 housewives were yet working part time. The average service in the present occupations in the group was six years, and 97.3 per cent like their present jobs, for the following reasons: variety of work, outdoor work interesting, own boss, good wages, good place, meet people, requires skill, like co-workers, helping others. The reasons given for not liking their work were: too confusing, do not like indoor work, and not what I want.

Twenty-nine or 26.1 per cent of the 111 interviewed were working at the same places at which they had taken their P. T. Co-operative Training. The group estimated that each had learned an average of 1.1 skills that they now apply on the job during the high school course. This means that in their own opinions these people learned about half as many skills while in the high school Co-operative Training Program as they had learned in their average 6 years service on their present jobs.

TABLE III. Work Record

Year graduated	Place Now Working: Same	Different	No. Skills Learned: In H. S.	After H. S.	Evaluation of Skills: Learned in H. S.	Learned after H. S.	Reasons for Changing Places
1938	8	4	1.2	4.1	3.0	4.0	Promotion
1939	6	12	1.1	2.5	3.2	3.9	Married
1940	4	16	1.0	2.0	4.0	3.2	Didn't like boss
1941	7	26	1.1	1.7	3.3	3.8	To college
1942	4	24	1.2	1.5	3.4	3.5	Business slack
							Health
							Own boss
Total & Averages	29	82	1.1	2.4	3.4	3.8	Too much routine
							Worked nights

The evaluation of their skills on a 0–5 point scale was 3.4 points for those learned in H. S. and 3.8 points for those learned after leaving high school.

The chief reasons for 82 of them changing their places are listed in the last column. The five who went to college attended on the G.I. Bill and all five had a good college record.

TABLE IV. Senior High School Record

Subjects taken, number taking each subject, average units in each subject, average grade, average evaluation, and reasons for taking the subject.

Subjects	Number Taking	Av. Units in S. H. S.	Av. Grades in S. H. S.	Average Evaluation	Reasons for Taking the Subject
English	111	3.0	81.3	3.7	Req. 111; Gen. ed. 17
Soc. Sci.	109	1.9	81.0	2.8	Int. 50; Req. 33
Phys. Sci.	84	1.0	82.9	2.1	Int. 51; Gen. ed. 15
Math.	73	1.3	82.3	3.4	Int. 48; Adv. 15
Language	7	1.0	84.0	1.0	Req. 5; Adv. 2
Ind. Ed.	111	4.2	87.7	4.4	Int. 103; Adv. 24
Com. Ed.	68	1.5	84.0	3.1	Int. 52; Adv. 12
Phys. Ed.	64	0.8	P	3.0	Int. 30; Req. 27

The whole group took English because it was required. They all took industrial education also because the part time co-operative work is included in that department. Some of these pupils had taken work in each of the eight departments listed, ranging from seven in foreign languages to all in English and industrial education. The average number of units ranged from 0.8 in physical education to 4.2 in industrial education. The average grades ranged from 81 per cent in the social sciences to 87.7 in industrial education with an average in all departments of 83.3. Their evaluation of subjects varied from 1 point for languages to 4.4 points for industrial education with an average evaluation of 2.9 points. The chief reasons given for taking the various subjects seemed to waver between interest, requirements, and advancement.

TABLE IV

Vocational subjects taken with reasons given, evaluation, and suggestions for improvement.

1. Number taking part-time co-operative training — 111.
2. Reasons given for taking this subject.

Reasons	Number Giving This Reason
To learn a trade	90
To finance high school education	78
To make extra money	86
To learn about different jobs	84
To be out of school part time	25
Less sitting or more activity	24
Less study	22

Ninety had taken the part time work to learn a trade and 78 had taken it to help finance their high school education also. Most of them confessed that getting through high school would have been very difficult for them had it not been for this chance to help finance their individual programs. Eighty-six said the reason was also to make extra money, whereby they could have extras which would have been impossible otherwise while in high school. Eighty-four said they wanted to learn what a job demands of them and what it takes on their part to adjust to a real job. The last three reasons were all given by a group which fall broadly into that general class who do not want to attend school, yet they sense the importance of graduation from high school. A large majority of this group said they probably would not have completed high school if full time attendance had been required of them during their last year.

3. Evaluation of part-time co-operative training.

Item Evaluated	*Average Points 0–5*
Guidance	3.6
Human relations	4.1
Learning skills	3.8
Learning to adjust to a job	4.1
Training to observe	3.8
Taking and following directions	4.1
Developing responsibility	4.5
Average evaluation for P. T. Co-op. Training	4.0

All items were checked as quite valuable, the range being from 4.5 points for developing responsibility to 3.6 points for guidance, with an average of 4.0 points for all items listed.

4. Suggestions for improving the Co-operative Part-Time Program.

Suggestions for Improvement	*No. Checking Each Suggestion*
More related work	77
More supervision	51
More vocational subjects	97
More guidance	78
More training	67
More follow-up	100

The group was almost of one accord on follow-up, but most of them felt that two or three years after graduation would be long enough to keep a file on follow-up of those being graduated. They also felt that much help could be given to many by the school through a properly conducted follow-up system in helping to adjust to post school life.

Summary

1. The total number of former pupils participating in our Co-operative Part-Time program during the years 1938–42 inclusive were 173 boys and 35 girls or a total of 208.

2. Ten years after graduation from high school there were 140 or 67.3 per cent living in Iowa, 41 or 19.7 per cent living in other states, nine or 4.3 per cent deceased, and 18 or 8.7 per cent that could not be located.

3. Of the group living in Iowa, 111 or 79.3 per cent lived in the local community and 29 or 20.7 per cent lived in other communities in Iowa.

4. The 111 people living in our local community were working at 27 different occupations.

5. Seventy-eight or 70 per cent are working in the same occupational areas for which they had received Co-operative Part-Time Training while in high school.

6. Twenty-nine or 26.1 per cent are working at the same places where they received their training.

7. One hundred four or 97.3 per cent are happy in their work.

8. The group estimated they had learned an average of 1.1 skills each in the Co-operative Part-Time course and 2.4 skills each while working on the job after graduation. The average evaluation of these skills on a 0–5 rating score was 3.4 points for skills learned while in high school, or 3.8 for skills learned on the job after graduation from high school.

9. The school records showed the average senior high school grades of the 111 local men and women interviewed was 83.3 per cent.

10. The average evaluation for all high school subjects taken by them was 2.9 on the basis of a 0–5 scale rating.

11. The two highest reasons checked for taking high school subjects in general were requirements and interest in the subject.

12. The two highest reasons given for taking Co-operative Part-Time Training were: To learn a trade and to make extra money.

13. In evaluating Part-Time Co-operative Training on a 0–5 point scale, the average rating was four points with *Development of Responsibility* receiving the highest rating.

14. The highest recommendations of the group were for more follow-up on the part of the school after graduation.

A bullet-proof, self-sealing gasoline tank made of silk, wool or other cloth is now available for military aircraft, where weight is a big factor. It is made of several layers of cloth, glued together on the bias. Inside the cloth is a self-sealing liner, made of a material which will swell upon contact with gasoline. The swelling seals the bullet holes. New methods and materials for furnishing petroleum to the armed forces give them assurance of an abundant supply.—*Petroleum Newsnotes.*

Increasing numbers of adults have been stricken with polio in recent years. In New York City alone the proportion of polio cases among persons 15 and over jumped from about 2 per cent in 1916 to nearly 23 per cent in the period 1947–51. The March of Dimes pays treatment costs in whole or in part for all who need help, regardless of age.—*Public Relations Department, National Foundation for Infantile Paralysis.*

3-Dimension shop layout of a general shop by F. C. Finsterbach, Plainfield, N. J.

Continuation Education—Origin and Underlying Philosophy*

EDWARD A. FITZPATRICK
President, Mount Mary College
Milwaukee, Wis.

I am pleased on the occasion of the laying of the cornerstone of this immense addition to the Vocational School to say a word about the school's origin and its underlying philosophy.

The 1909 Resolution

The movement of which this school is the fullest expression had its origin in a resolution written by Charles McCarthy introduced in the Wisconsin Legislature by Senator Fairchild, now Supreme Court Justice. It was an innocent enough resolution creating a commission on industrial and agricultural training, making certain public officials members ex officio with authority to use their office staff and asking for no appropriation. They were to seek a remedy for the conditions stated in the resolution:

1. The existence of 104,000 illiterate in the state.
2. The trend toward night school and night trade school.
3. The persons of school age who cannot attend school full time.

McCarthy, the Social Architect

McCarthy, architect of the whole scheme, the inspirer, sponsor, and spark plug, ex officio a member of the commission, was assigned the job of reporting on industrial training and a special committee of outsiders was to report on agriculture. McCarthy, without expense to the state, visited various cities in the East and also in Germany, Belgium, and England. As a result, McCarthy was fired with greater enthusiasm for his idea. This wedded to his vision, his imagination, and his practical sense made him irresistible. He wrote the one hundred pages of the 1917 report on industrial training. The practical program of the commission was a compromise to meet particularly the opposition of the state superintendent of schools. In 1911 McCarthy drafted the bill which became law, carrying out the recommendations of the report and appropriating enough money to print a thousand copies of the report.

Education for the Educationally Disinherited

Such was the beginning. McCarthy's concern was the great number of young people who were not in school and for whom nothing was done, nor was any thought given to them. They were the castoffs of the educational system. They were educational casualties. They failed to make progress in the school system, and were in many cases ill-adapted to the teaching or the curriculum of the full-time academic school. Whatever they learned in school, as Dewey said, was of no use to them outside the school, and whatever they learned outside of school was of no use to them in school. They left the school at the first moment they could, when they reached the sixth grade or were 14 years old. They were permitted to drift. They were the flotsam and jetsam on the social sea. They were, to change the image, the educationally disinherited. Among these children there was great potential talent, and the greatest waste of education is human talent. McCarthy sympathized with these children for he had lived among them in the shoe-manufacturing town of Brockton, Mass. He was conscious of the social waste, of the economic waste, and of the human waste. He wanted to give these children their human and educational inheritance. And if necessary, he would begin by doing something where nothing had been done or was being done.

Organizing a Lobby Against Educational Opposition

Perhaps a word may be said at this point about the legislation. The State Superintendent of Schools, Mr. Cary, was to put it mildly lukewarm, though he had been a member of the commission. The powerful, compact city superintendents of schools, with a few exceptions, were opposed especially to the separate board. There was practically no educational support of the bill. But a powerful lobby in support of the bill was built up. The socialists in the legislature were for it. H. E. Miles of Racine and of the National Association of Manufacturers came to oppose the bill but McCarthy converted him. Ohl and Handley of the Federation of Labor were easily won to the support of the bill. And under the pressure of A. L. Lindeman of the Waukesha Fox Head Brewery, Bill Austin and the brewery lobby were enlisted and so, as you might expect, the bill passed. Legislation, as you see, is not always the effect of organized public opinion.

Perhaps a word may be added about another piece of legislation which was the practical fruition of the plan. In 1921 a bill was introduced raising the age limit to 18 for nonhigh school graduates, requiring half-time attendance between 14 and 16, or eight hours a week (two half days) between 16 and 18. The original tax ½ mill in 1911 which was raised to ¾ mill in 1917, was again raised to 1½ mills. McCarthy died while the bill was in the legislature, and it became my duty, as secretary of the state board of education, with my assistants, to take over the responsibility. It is interesting to note that Mr. Schultz of Sheboygan, the president of the state board of vocational education, and Robert Cooley, to whom this school owes very much as does vocational education in the United States, were fearful and hesitant about such a long step forward at one time, but by a simple legislative device of starting the identical bills in each

*Address delivered at the laying of the cornerstone of the new addition to the Milwaukee Vocational and Adult Schools, on February 5, 1953.

house and keeping the opposition's attack centered on one of them, the other bill went through.

The Need for Continuation Schools

Now let us turn to the more substantive aspects of the problem: its content and its philosophy. The problem centers around the educationally disinherited, the neglected, and the lack of educational opportunity. The 1909 resolution said there were 104,000 illiterates in the state according to reliable statistics. Before the end of the high school period for 90 per cent of the children of high school age there was no further educational opportunity. The educational casualties, especially in the first year of the university, were very high. In short, the diversity of educational and social needs were overlooked. For the academic minded, for those capable of profiting by book learning, for those dealing with verbal symbols rather than realities, there was extraordinary educational opportunity, but for the others — nothing!

German Experience Helpful

McCarthy was impressed by the fact that in class-conscious Germany, with the tremendous prestige of those who went to gymnasium and university, there were already "Realschulen," but more particularly there were the "Fortbildungschulen," or continuation schools. Kerchensteiner revealed the possibilities of such schools. McCarthy was also impressed by the fact that these new schools had to be developed under the commerce and industry department and not in the education system. He intuitively saw that these ideas must find in democratic America a different implementation than in class-conscious Germany, while recognizing the importance of the practical principle.

Three Problems

Some of the problems facing those interested in the plan for the educational disinherited were:

1. To whom should be confided the responsibility for protecting and guarding as well as promoting the new plan.
2. How could it be given stability.
3. How could the quality of it be developed so that it would be not merely patch work but genuine education.

Who Would Develop the Plan

The plan, let me repeat, was made necessary by the failure and neglect of the regular educational authority. The initiative was taken by others than educators. The opposition was led by the state superintendent of public instruction and supported by a powerful organization of city superintendents. Obviously, the ordinary school authorities were not to be trusted with the new responsibility. The German situation with its extraordinary success had a suggestion. The new school should be placed under other public authority — in their case, the commerce department. McCarthy saw that the job could not be turned over to the ordinary schoolmen or board of education, nor on the other hand could it be removed from educational influence and left to the economic forces. Hence was devised the state board of education with its industrial, labor, and agricultural members with the state superintendent and the dean of the University Extension Division on the board, and the local board was made up of labor and industrial members elected by the city board of education with the city superintendent as the ex officio member.

Accepting this plan in principle and rejecting the name calling of school authorities in their desire for power calling it "prussianizing of education" or a system of "dual control," the main problem is to keep labor and management representatives working co-operatively. The tragic social incompetence of labor and capital to have ideals of co-operation take the place of obsession of conflict in a continuing industrial cold war must not enter here. Dominance by either group would be fatal to the continued education of these young people. There have been efforts to secure such domination, but fortunately they failed.

The Danger in Centralization

There is, let me add here, no virtue in centralization of authority and there are grave dangers. In the continuation school there is greater opportunity for experimentation, for recognizing more diverse educational needs, and for promotion of greater educational opportunity. This is an educational safety valve. The consolidation of these systems of educational authority should be considered only if either labor or management become dominant, or if there were any competition for students, or if the need for special types of teachers, special and various curricula, should disappear, or the problem of the continuation of the adult education classes ceased to be as distinct as they are from the full-time education of elementary and high school pupils. These are the questions that must be answered, not whether the vocational school in Milwaukee wisely or unwisely wanted a TV station.

The Problem of Stability

The problem of stability was solved by giving the local board of vocational education taxing power up to a minimum in 1911 of ½ mill. This gave it independence as well as stability. It protected these educational opportunities against an ever present danger in the public schools, that these things would be regarded as fringe activities or even fads and in the first curtailment of budgets they would suffer. Those responsible for the plan for the disinherited children were determined that these children really got an opportunity that was certain.

Working Children Are Human Beings

To answer the third question the fact must be recognized that these children were not only working people, but they were citizens and human beings in all their diverse human relations. The A. F. of L. had said in one of its publications that the problem of education in its lower levels was not training for industry, but training for life in an industrial society. And Mr. Miles of the National Association of Manufacturers had said, "Vocational education was not teaching for an occupation only, it is the making of men and women." When the curriculum was being formulated for the Smith Hughes federal legislation, Wisconsin was responsible for including "vocational and civic intelligence" in addition to trade training. The humanity of these working people, needing a human development, was the central fact of this educational plan.

The Educational Open Road

This was the purpose of McCarthy and all of us. We wanted the general education of each child continued, and we wanted the educational and spiritual value developed through the vocational materials as the ordinary school tried to reveal them through the so-called cultural materials. Even for many children who survived in the educational machine, they were never revealed.

What was wanted for the disinherited children was an open educational road.

The Need for Effective Teachers

In the early years there was groping and achievement was, frankly speaking, disappointing. But McCarthy had his stock answer to doubters. It was something where there had been nothing. One of the main problems was teachers. McCarthy had anticipated this need and to McCarthy's pleas and needling of the University, which was certainly without any vision in this whole development, the pathetic proposal was more manual training teachers. The teacher and the craftsman were often not found in the same person. That problem had to be solved and it is not part of my function here to tell that story.

Continuation — A Distinct Problem

The vocational educational ideal in Wisconsin has conceived of education as lifelong for the child who will be worker, citizen, and human being. It will achieve the educational end using the vocational material. It is a distinct problem to do this and most of the formal education groups have no or little sympathy with it. Hence, the need for separate organization.

Wisconsin's Motto Is Forward

The continuation school was part of a great genuinely democratic scheme of education of which University Extension was a phase — conceived not by the educational authorities but in the body politic. It was to provide for the flexibility and adaptability which the formal education loses in the emphasis on formalism and verbalism. This special organization was to do, if I may borrow the image from law, what equity did for the common law. Just as equity made justice possible outside the formalism of the regular procedure, so the continuation school was an educational equity. It was educational justice to the educationally disinherited — who were outside the pale of formal education. Let us preserve these sparks of vitality and the germinal possibilities of education. If these instruments tend to fossilize, let us create new instruments based on that vision of life, of human nature, of social well-being without which people and nations perish. The motto of this state is "Forward" and let those who would consider change understand how the things that are, came to be, for the "past is but prologue" and not revert to mummified education nor an education based on mere social change, but on the eternal spirit of man and its divinely immanent glorious possibilities.

Printing The School Newspaper

HAROLD R. JOHNSON
Minneapolis, Minn.

Setting Advertisements

Advertising is usually made use of by the school newspaper to help carry the cost of production. If the paper is produced in the school's printing department, advertising composition may be made to serve as an excellent medium for teaching typography. A school that does not capitalize on this opportunity is missing one of the best possible means that may be provided for students to learn and practice the principles of printing.

In advertising composition a student gets training in:

1. Visualizing and planning
2. Working to a layout and making layouts
3. Recognizing, choosing, and matching type faces
4. Setting display; applying principles of display
5. Justifying to varying measures
6. Spacing out, grouping, use of white space
7. Cutting and mitering borders
8. Setting and handling straight matter
9. Setting various indentions
10. Proper use of initial letters
11. Creating unusual shapes with type
12. Sawing and fitting illustrations
13. Setting prices
14. Letter spacing, word spacing, and line spacing
15. Copyfitting

Most desirable size for an ad that will give the student an opportunity to get experience in the foregoing operations should be at least one column wide, by three inches long. Smaller ads would probably be set in simpler form and would be valuable in only some of the afore-mentioned respects. Larger ads are less restrictive and provide the opportunity to use greater variety.

When a student is given an ad to set, he should follow these logical steps:

1. Study the layout and the nature of the copy.
2. Interpret the copy in terms of what the advertiser wants and what the reaction should be on the reader.
3. Note size of ad and any special instructions.
4. Visualize the ad as it should look when completely set in type.
5. Choose border, cut to exact length, miter corners or butt, and assemble border as a skeleton.
6. Cast, rout, and saw stereos if necessary.
7. Place cuts in position.
8. Select type best suited for display; set display.
9. Set straight matter on machine or by hand.
10. Place display and straight matter in position, space out.
11. Check justification of the various parts of the ad, allow for *squeeze*.

12. Proof and correct.

Layouts should be made with extreme care and accuracy. A student would best start with a relatively simple ad and learn to follow directions explicitly. Positioning of groups and spacing between groups should be shown on layout as they are to appear in final ad. Display lines should be lettered in, cuts or illustrations pasted in, straight matter represented by straight lines, bold by double lines, and borders should be indicated by a sample or number. Students should note that illustrations or type groups on the right side in the layout will be set on the right side in the type form. A common error is to reverse them. Be sure of the column width, and the length of the ad.

In studying the layout and copy, the student should note the type of company and product and interpret the meaning of the message the ad is intended to convey. If the ad is for girls' wear or jewelry a light treatment will be appropriate and light decorative type and ample white space should be used. On the other hand if the ad is for sports togs intended for boys' reading, a bolder, more virile treatment will be called for. This information should be kept in mind in choosing the type and the border. Careful note should be made of the size of the ad and any accompanying instructions in regard to the typesetting.

With all facts in mind the student should then form a mental picture of the way he thinks the ad should look when completely set up in type. For some this will prove to be the most difficult step in the entire production of the ad, but with concentrated effort and practice some degree of success can be attained. The more vividly the completed picture of the ad is visualized, the more successful and appropriate will be the result. In addition, less is left to chance and fewer changes will need to be made.

A picture should be formed in the mind's eye of the ad as a unit and also as a part of the page where the ad will finally appear. Herein lies one of the most valuable lessons printing can offer as an educational subject — planning and creating. Planning and carrying through to completion — with the hands carrying through the plan that the mind has conceived and visualized. A student thus has the opportunity to put more of himself into his work — the skill of his hands plus the idea that has been blueprinted in his mind.

When this preliminary planning has been done the actual composition of the ad can be started. The first step is to select the border, cut it to correct length and miter or butt the corners, and build these borders up as a skeleton. If the system calls for spacing slugs between the border and the type, these should be inserted. Over-all dimensions of the ad are usually taken from cutoff rule to cutoff rule.

Next, cuts are sawed, routed, measured, and inserted in desired position. When a cut comes in an uneven measure, i.e., 12 picas, 3 points, the student learns to set type alongside the cut in an even measure and insert leads or slugs vertically to justify to correct width. Cuts should be sawed to even or half-pica measure whenever possible to facilitate spacing. Measures alongside cuts should be carefully checked before type is set or spacing inserted. Type in an ad may be run around an illustration, following outline or shape of a figure. If the cut is placed in at an angle leaving triangular or irregular shaped openings these may be filled in by pouring in metal or using plastic wood.

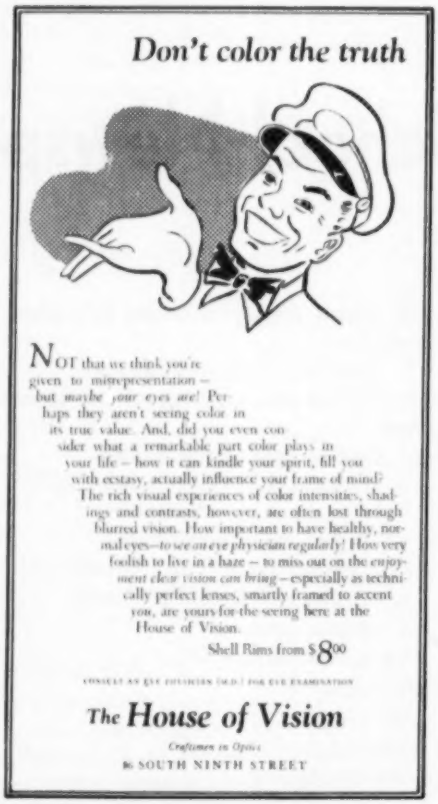

Don't color the truth
NOT that we think you're given to misrepresentation — but maybe your eyes are! Perhaps they aren't seeing color in its true value. And, did you even consider what a remarkable part color plays in your life — how it can kindle your spirit, fill you with ecstasy, actually influence your frame of mind? The rich visual experiences of color intensities, shadings and contrasts, however, are often lost through blurred vision. How important to have healthy, normal eyes—to see an eye physician regularly! How very foolish to live in a haze — to miss out on the enjoyment clear vision can bring — especially as technically perfect lenses, smartly framed to accent you, are yours for the seeing here at the House of Vision.
Shell Rims from $8.00
The House of Vision
Craftsmen in Optics
86 SOUTH NINTH STREET

Fig. 2. Working to a layout

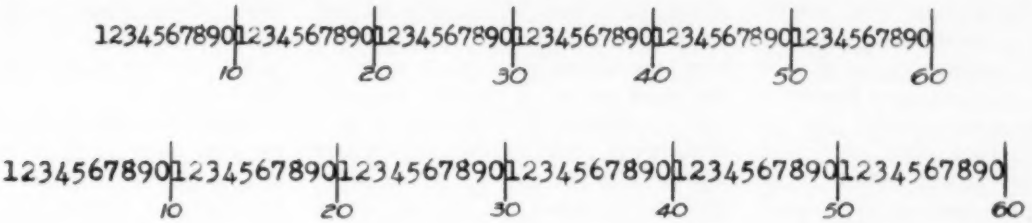
In producing the advertisement shown in Figure 2, a student gets practice in (1) working to a layout; (2) recognizing, choosing, and matching type faces; (3) setting display, applying principles of display; (4) spacing out, grouping, use of white space; (5) cutting and mitering borders; (6) setting and handling straight matter; (7) proper use of initial letter; (8) creating unusual shapes with type; (9) sawing and fitting illustrations; (10) setting price; (11) letter spacing, word spacing, line spacing. In addition the student learns to visualize by planning the ad from the beginning and making the layout, and he may get practice in copyfitting.

The nature of the company or product will suggest a type best suited to the purpose — a type that will aid the reader in getting the "feel" of the product or the impression desired by the company. In order to do this a student in printing must learn the types available in his shop. Single line specimen sheets will give a comparative view of the types available and will help the student to determine in what capacity each may be used to advantage.

The student will learn that certain type faces may be used together harmoniously and that others, when they are combined, jar on the eye. He will, of course, become familiar with the type sizes. Display lines should be set with all other display lines in mind.

Body or text matter should next be given to the linotyper, correctly marked as to measure and size and style of face desired. If the school does not have a machine, this body type must be set by hand.

In order to determine what type face will fit accurately, the student should copyfit his type. He must figure his copy in a certain number of lines in the desired pica width. There are a number of copyfitting systems, some very complicated, some relatively simple. Linotype, Intertype, and Monotype publish tables of their type faces which give the number of characters per pica. In using the Linotype table, for example, we find that 2.68 characters of 8 point Excelsior with Bold can be set in 1 pica. Therefore, it is possible to set 32.16 characters in 12 picas. After the number of characters in one line has been determined, it is only necessary to divide the total number of characters in the article by this figure to ascertain the number of lines. A display line can be figured by the same method. For example, 1.52 characters of 18 point Bodoni Bold 275 (Monotype) can be set in 1 pica, or 18.24 characters in 12 picas. It is necessary to watch for the *W* and *M* and very thin letters. For a close fitting display line, 18 point or larger, the safest method is to trace each letter from a printed specimen of the desired type face, or set the line in type. In tracing it is well to use dividers.



A Simple Method of Fitting Copy

1. Determine type face you wish to use.

2. Obtain a proof of the lower case alphabet of that type face.

3. Measure with a pica rule from the beginning of the a to the middle of the x. *That measure will take 25 characters in composition.*

4. Compute the number of characters in the composition, using one of the scales given below:

Pica typewriter type, 10 characters to the inch:

Elite typewriter type, 12 characters to the inch:

5. Note pica length of line to be set.

6. Determine number of characters that will go in that length line.

7. Divide this figure into total number of characters in copy to find number of lines copy will make.

Example:

1. Type face — 8 point Caslon 337.

2. Make a proof of the lower case alphabet.

3. Measure with a pica rule from *a* to middle of $x = 8$ picas. 25 characters in 8 picas.

4. Characters in composition, 1285.

5. Length of line to be used = 12 picas.

6. Number of characters in 12 pica line, $25 + 13 = 38$. (25 characters in 8 picas; 13 characters in 4 picas.)

7. Divide 1285 by 38.

$$38 \overline{)1285.00} \; 33.81 \text{ or } 34 \text{ lines}$$

114
145
114
310
304
60

If there are quite a number of capital letters in the composition, they should be figured separately as fewer caps can be set in a line. Twenty-five cap characters of 8 point Caslon 337 will measure 11½ picas.

Count the caps in the copy; for every 25 add 3½ picas to the total length of job. (Difference between length of lower case and cap alphabet, *A* to middle of *X*.)

PRINCIPLES OF DISPLAY

Fig. 1. Principles of display

When the display lines and straight matter are set, these elements should be placed in correct position in the ad, with proper spacing between groups. Remember that logical grouping of units aids the reader in an understanding and quick grasp of the ad. A lead omitted or inserted between two lines can add immeasurably to the legibility of the printed matter. Letter spacing is often necessary in both display and straight matter. The student learns that letter forms affect spacing, and some letters must be mortised, and the spaces opened between others.

After all of the various parts of the ad have been placed into position, the justification should be checked to see that totals are correct in length and width. Counting points to check dimensions is important. Several points must be allowed for *squeeze*, the amount depending on the number of lines and the length of the ad.

Now the ad is ready for tying up, proofing, and correcting.

An orderly system for handling copy and proofs is important in the school shop where more than one student may work on a single ad. A hook for ads to be set, and one for copy and proofs of the ads that have been finished, each clearly labeled, is one simple method of handling this problem. In addition an "Unfinished Work" bank, where partly finished ads are kept together with the copy, is a helpful device for handling larger ads that cannot be finished in one period of work. Students in subsequent periods can pick up the work and carry it through to completion.

Initial letters may be used in larger ads, giving practice in this method of display. *Up initials*, particularly in script faces, give the student opportunity to line up two different type sizes. Shoulders are often shortened on initials and this calls for careful sawing and fitting. Prices occur frequently in advertising and may be set in many different styles of type may be justified in a mortised opening in a cut, these problems providing further composition technique.

Hanging indention, half-diamond, squared, ascending and descending staggered, left and right increase and decrease are some of the indentions that can be used to good effect in advertising composition. Ovals, circles, diamonds, keystones, and other unusual shapes can be created with careful planning of indentions but occur less frequently.

Advanced students should be given ample opportunity to make layouts of the rough copy that comes into the print shop. Neatness and accuracy are essential. In this work students can apply the principles of display, harmony of shape, harmony of different kinds of types, tone harmony, contrast, proportion, movement, unity, variety, rhythm, and repetition. Larger ads, particularly, can be used to demonstrate the use of white space.

Group instruction will be needed to acquaint new students with the intricacies of the system used in producing a school newspaper. But after the beginnings have been made, individual work will supplant much of the classwork. Students learn to come into the shop, find their assignment, and set needed copy with little direction.

The possibility for unlimited variety in advertising typography makes this type of work one of the most valuable in the teaching of printing and allows for the continued progress of the individual.

Community Employment Opportunities For High School Students

SHELDON WILLIAM COLE

Industrial Arts Department
The Florida A. & M. College
Tallahassee, Fla.

The problem of employment for high school dropouts and graduates may seem to be a problem for administrative consideration but in reality it is just as important to the average instructor as it is to the counselor and principal. The industrial-arts instructor can play a major role in such placement in an indirect manner. Since the shop engages in a variety of activities that are related to the activities of the community then an evaluation of these activities or resources in relation to the potential dropout needs can be applied to our shop instruction. Since the problem confronting our educational system today is adequate preparation for youth in areas that will aid them in life adjustment, then any concrete aid given this problem will aid greatly toward a solution.

Community Resources

Community resources can be defined as those aspects that aid community life either socially or economically. These aspects include every type of industry, agency, and small private businesses that exist. Thus, these resources can and do include every phase of employment possible. As employment prospects fluctuate with certain economic conditions, each resource of the community should be given a careful analysis in relation to its employment prospects for high school dropouts and graduates. In addition to this analysis and to the known means of employment, a complete canvass of the community should be made to uncover all available industries that are possible sources for such employment.

Resources Analyzed

These resources can be analyzed the same for each community. The employment potentialities of no industry should be taken for granted, but the results of such available employment should be received firsthand and treated as primary source information. Certain trades and industries vary as to working characteristics due to the locality and to the size and type of industry. Thus, each job title cannot be analyzed in relation to the overall picture but rather as it is related to the working conditions of that area. This is due to the mass production techniques that are now used throughout industry. In turn, a trade once handled by one worker is so broken down, in modern industry, that all of the skills are not necessary to effectively complete the job. In most instances a dozen or more people are employed to complete one job originally done by one or two. In another sense, the same craftsman can be found in a smaller shop, where his skills and techniques are very much needed and are more effectively carried out by one or two. Thus the need for a complete analysis of an industry, according to the community, is definitely necessary.

Placement Preparation

After such analyses are made of the industries, a criteria should be set up consisting of the listed required skills and personal qualifications that are generally requested by these local industries. This is not done to change the structure of our educational program but to add a more effective means of meeting the needs of our students. The program would, however, be developed to allow all students to prepare in the listed qualification, thus not overlooking any that might be potential dropouts. The effectiveness of this would depend largely upon the close and effective relationship maintained between the institution, the students, and industry. This in itself would present the resulted effectiveness of the program.

Community Potentialities

The employment potentialities of one's community resources are and can be unlimited. These can be uncovered through directories, newspaper, and personal contact. In all instances, however, the student should be made aware of the existence of the same and at the same time the possibilities of better growth if one continues his education. Each industry no matter how unique, large, small, or specialized, has some type of beginning and standard positions that are opened to the unskilled. In other instances even the most skillful of positions may be filled by workers who are trained on the job, while in still other instances, training paid by the firm, is carried on in schools supported by the firm.

In most instances, even though many industries have openings for unskilled workers, there are many trades that are in constant need of young people to serve apprenticeships. In most cases the beginning salaries are small, but the job potentialities are great. High school education in most cases is required but the possession of certain aptitudes and skills are generally acceptable. Even in the jobs requiring skilled workers, there are certain personal qualities that a person must possess in order to succeed. This also holds true even in jobs requiring but little skill. These qualities which should be constantly emphasized are the need for promptness, cooperativeness, honesty, carefulness in using personal property belonging to others, etc.

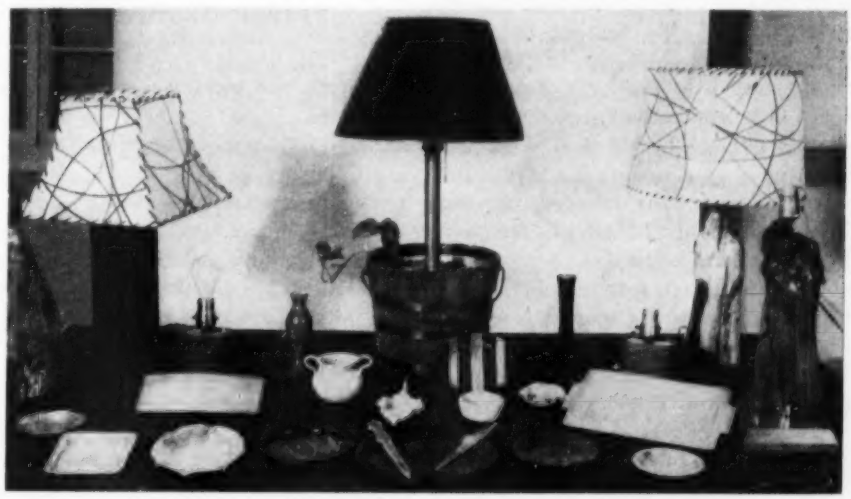
The problem of placing high school dropouts is one that not only taxes our educational programs but brings out the necessity for re-evaluating it. However, since we are confronted with this problem we must find some way of solving it. This involves the following factors:

1. Location of possible sources for employment
2. Qualifications of available positions
3. Indoctrination of students to job potentialities and qualifications
4. A form of follow-up service to determine the shortcomings of our educational program
5. A close working contact with these sources to aid in student preparation for future positions.

No matter how large or small, there are resources within one's community that can aid in the placement of those who leave school early. In most cases the potentialities of some of these resources are not easily recognized, but such as they are, they should be listed, analyzed, and evaluated.

It must not be understood that we must strive to constantly place all our *dropouts* but rather that we must re-evaluate our program to present adequate training to these and all students for proper life adjustment, and thus prevent students from dropping out of school.

It is estimated that close to 300,000 people have been victims of polio since 1938, enough people to populate any one of the cities of Birmingham, Jersey City, or Toledo, Ohio. More Americans were stricken with infantile paralysis in 1952 than in any previous year. — *Public Relations Department, National Foundation for Infantile Paralysis.*



Industrial-arts exhibit made by in-service and industrial-arts teachers enrolled in a summer workshop at Southern University. Submitted by E. C. Harrison, director, division of industrial and technical education, Southern University, Baton Rouge, La.

Frank M. Bruce, Publisher, Dies at 67

The employees of The Bruce Publishing Company were deeply shocked when they learned on Sunday, February 22, 1953, that Frank M. Bruce, Sr., publisher and treasurer of the firm, had died at four o'clock in the morning.

They had known that he entered Misericordia Hospital at Milwaukee for an operation. For the next two or three days there were only encouraging reports, and everyone felt that F. B., as he was commonly referred to at the office, would soon be back at his desk. But then, with the suddenness of all deaths, came the sad, dispiriting news, that he was no longer with us.

He was born December 25, 1885, in Milwaukee. He was graduated from Marquette College, received the B.A. degree in journalism from the University of Wisconsin, and an M.A. from Marquette University in 1910. He started his publishing career in 1905, when he became clerk in his father's office, who was publishing the *American School Board Journal*, the magazine which was the foundation upon which the present business was based. As time passed, he became the subscription manager and later western advertising representative.

In 1914, realizing that much needed to be done in the field of industrial education, William C., his brother, and Frank started the *Industrial Arts* magazine. This, the second periodical publication put out by the firm, continued under its original name until May, 1930, when its name was changed to what it is at present, *Industrial Arts and Vocational Education*.

With the two magazines offering entrance into numerous sources of educational and technical material, the firm began to publish books, and in the course of years they have developed a very presentable list of books covering the fields of aeronautics, auto mechanics, ceramics, architectural and mechanical drafting, electricity, farm shop, general shop, leathercraft, metalwork, plastics, printing, rehabilitation, related work, woodwork, and vocational education and guidance.

Frank M. Bruce

These activities of The Bruce Publishing Company were projected, planned, and carried out by the two brothers — William C. and Frank, Sr. Much of the business activity, which at present is carried forward by the 275 employees, was initially discussed by the two brothers on their daily jaunt, walking to and from the office — a round trip of three and one-half miles.

But business was not the only vital interest in Frank Bruce's life. Every person with whom he came in contact, be he subscriber, dealer, businessman, employee, or acquaintance, was to him a challenge to do something good for a fellow man. It mattered not what the nationality, color, or creed of the man might be.

He felt the same way about his duties to his community and the country at large.

He was always willing to put in much time and labor in the organizations to which he belonged, and he belonged to a goodly number.

Mr. Bruce was one of the founders and for 33 years the secretary of the National School Service Institute, a trade association of manufacturers and distributors of school equipment and supplies. He also was one of the founders and former president of the Milwaukee Advertising Club; a member of the University Club, Milwaukee Athletic Club; and a member and past president of the Rotary Club of Milwaukee. On the death of his father, he was appointed, in his place, to membership on the Milwaukee Auditorium board. He also served as a member of the Milwaukee County Community Fund and Council of Social Agencies.

Among his many friends are numbered many presidents and professors of teacher training institutions, as well as national, state, and local school superintendents, directors, supervisors, and teachers of vocational and industrial arts education.

He is survived by his widow, Alma, three sons, William George II, Frank, Jr., and Robert, two daughters, Mrs. Alice Mary Gaunt, and Mrs. Jane Quinn, his brother, William C., and a sister, Mrs. Monica Rock, and 14 grandchildren.

Ivan Attraction

An Industrial-Arts Play in One Act

HOWARD R. SCHRAMM
Shadyside High School
Shadyside, Ohio

CAST OF CHARACTERS: Ivan Attraction: A young, enthusiastic industrial-arts teacher who has just completed his first year of teaching at Ironwood High School; Mr. Ogden: A tall, middle-aged general manager of Continental Foundry and Machine; Bill Lyford: A high school freshman, Mrs. Lyford's son; Mrs. Lyford: An attractive woman in her late thirties, Bill Lyford's mother; Mr. Hill: A successful, retired owner of Pleasant View Farms; Don Covert: A young man, age around 30; The Conductor.

SCENE: The entire action of the play takes place in the club car of a modern streamlined diesel train.

TIME: The present. An evening in early June.

DESCRIPTION OF SET: Modern, comfortable chairs are spaced on the stage. A rear drop could be painted to look like the inner wall or side of a train coach. A record of a moving train with an occasional blowing of a horn should be played softly in the background if one can be obtained. Lights on stage should dim and flicker occasionally.

[*Ivan Attraction, a young industrial-arts teacher, returning home after teaching his first year at Ironwood High, is reading a book on* Industrial Arts Design *when Mr. Ogden interrupts.*]

MR. OGDEN: Pardon me, young fellow, but are you an industrial artist?

IVAN [*hesitantly*]: I don't quite get the point.

MR. OGDEN: What I meant to say, do you design products for industry?

IVAN [*with a slight chuckle*]: No. I'm an industrial-arts teacher.

MR. OGDEN [*astonished*]: Pray tell me, boy; what's that?

IVAN: Well, Wilber defines industrial arts as "those phases of general education which deal with industry — its organization, materials, occupations, processes, and products — and with the problems resulting from the industrial and technical nature of society."

MR. OGDEN: Whew! That's quite a definition but I still don't quite get the meaning.

IVAN [*trying so hard*]: You see we have a laboratory or shop in which we study industry and our technology — we make articles out of wood, metal —

MR. OGDEN [*interrupting*]: Oh! I get it. You're a manual training teacher.

IVAN [*very discouraged*]: No, but in a way yes. Manual training was introduced into the United States in 1876. This was followed by manual arts in 1894. Industrial arts is an outgrowth of these movements. Sometime around 1910 the term was first used to describe this curriculum area.

MR. OGDEN: That's good historically but just what *is* the difference?

IVAN: That's easy to explain. Manual training emphasized hand skills where the students did exercises mostly using wood but didn't make any useful projects.

MR. OGDEN: You mean it was merely "busy work" and practice.

IVAN: That's right. Manual arts still emphasized skill but projects were made which were useful and well designed.

BILL [*enters left and asks*]: Pardon me, gentlemen, but could you tell me what those workmen are doing out there along the right of way?

MR. OGDEN: They are laying coaxial cable.

BILL: What's that?

IVAN: Coaxial cable is used in television to send the sound and picture over a long distance. Let's say that a boxing match is being held at Madison Square Garden in New York City. Theoretically, television only operates within a sixty mile radius but with coaxial cable, the fight can be sent to other stations all over the United States and they, in turn, can then televise it.

BILL: Aren't we living in a complicated age?

IVAN: We certainly are living in a highly complex industrial and technological society. Just look at this modern diesel streamliner we're riding in and that huge hydroelectric plant we passed a few miles back.

MR. OGDEN: How do you know so much about this coaxial cable?

IVAN: We study about coaxial cable and other technological advances in our industrial-arts laboratory or really a laboratory of technology.

MR. OGDEN: I'm Harry Ogden.

IVAN [*shaking hands with Ogden*]: How do you do. I'm Ivan Attraction.

BILL: I'm Bill Lyford. Mother and I are going to visit my grandparents in Continental City.

MR. OGDEN: That's where our plant, the Continental Foundry and Machine, is located. You'll have to pay me a visit, Bill.

BILL: That would be swell. I've never been in a factory. I surely would like to see what one is like. They won't even let us kids in factories at home.

MR. OGDEN: That's a novel looking belt you're wearing young man. Where did you buy it?

BILL: I made it at school.

IVAN [*elated*]: I suppose in your industrial-arts class.

BILL: No sir.

IVAN [*depressed but interested*]: Where then?

BILL: Well, you see I'm in college preparatory — want to be a doctor — they won't let us kids take industrial arts since they don't have room for us in the already crowded shops. Anyway, Mr. Rittman, our principal, says industrial arts won't do us any good — it's for the dumb kids.

MR. OGDEN: Where did you make the belt? Are they teaching you to do such things in Latin now?

BILL: A group of us boys and girls, who didn't get to take industrial arts, talked Mr. Wright, our industrial-arts teacher, into organizing an after school industrial-arts club. We make all sorts of things.

IVAN: That's swell, Bill. You see industrial arts is a phase of general education for all boys and girls.

MR. OGDEN: It's too bad that all students don't get to take it. We didn't even have anything like that where I went to school.

IVAN: All students get to elect industrial arts in a few schools but they are certainly few and far between. In fact, there are many small schools that don't even offer industrial arts.

MR. OGDEN: I'm interested in this thing called industrial arts and I'd like to know more about it. I'm general manager of Continental Foundry and Machine and am wondering what effect such a program would have on our plant. Does it cost much money? We're so burdened with taxes now that we can't make a decent profit.

IVAN: I've got some 2 by 2-in. slides here which I completed a couple of months ago. I think they would answer many of your questions, Mr. Ogden. Would you like to see them? I don't think the conductor or other passengers would mind. The lights have been dimmed and I think we can get fair projection on this wall.

MR. OGDEN: I certainly would like to see them! Can't afford to miss a good show.

[*Ivan gets his slide projector and makes ready to show the slides.*]

IVAN: Bill, will you take this extension cord and plug it into the electric outlet over there?

BILL: Sure.

IVAN: Thanks, Bill.

[*Bill leaves with extension cord. Mrs. Lyford gets up and walks over to Mr. Ogden and Ivan.*]

MRS. LYFORD: I've overheard some of your conversation and am wondering if that active son of mine is bothering you.

IVAN: Not at all. Won't you join us? This is Mr. Ogden and I'm Ivan Attraction.

MRS. LYFORD: How do you do, gentlemen. I'm Mrs. Lyford. I'd simply love to see the slides. Where have you shown them before?

IVAN: The board of education, a teacher's meeting, Parent-Teachers Association, and the Local Chamber of Commerce has seen them so far. My father wants me to show them at the Kiwanis luncheon, Tuesday, in my home town.

MRS. LYFORD: I might get you to show them to our Child Guidance Club.

[*Several other passengers sensing activity move up probably expecting to see some vacation pictures.*]

IVAN:[1*] This slide shows the Energy Output From Mineral, Fuels, and Water Power Compared With Work Animals and Humans 1850–1860. Notice the sharp decline in animal energy over the past century and the increase of technical energy.

MR. HILL: I've been a farmer for over seventy years and I've actually seen these changes take place on the farm. Don't even use horses any more — everything's mechanized on the farm.

MR. OGDEN: I can remember when we used steam engines to run our lathes. We even rammed all of our molds by hand.

MRS. LYFORD: When I was a girl, we didn't have modern time-saving electric household appliances and that hasn't been many years ago.

IVAN:[2] The increase in patents from 1860 to 1950 is shown on this slide.

IVAN:[3] This slide shows more of our growing technology.

IVAN:[4] (*Atomic Energy Picture*) Just look what we can expect in the not too distant future from atomic energy.

BILL: We learned in school this year that someday steamships and airplanes will be run by atomic energy. Electricity will eventually be generated by atomic energy.

IVAN:[5] Many companies such as these have accelerated this rapid growth of industry.

MR. OGDEN: You should have included our company in that slide — grossed 250 million last year.

MRS. LYFORD: Industry and technology certainly play a vital role in our Democratic Way of Life.

IVAN:[6] These men have been instrumental in accelerating our technology.

IVAN:[7] These rapid changes have created many problems.

MR. OGDEN: I've seen that in our plant.

MR. HILL: Can't our schools do something about these problems?

IVAN:[8] They certainly can and many are. This slide shows a group of students presenting a forum on the Taft-Hartley Bill.

MR. OGDEN: Do you mean you actually discuss such controversial issues?

IVAN: Why certainly, Mr. Ogden. We strive to teach good citizenship and feel that such problems should be discussed intelligently.

MRS. LYFORD: That's an excellent idea and I know that young people are more interested in these problems than we adults think them to be.

IVAN:[9] This slide shows a boy hooking up electronic parts that will eventually be a radio. His problem deals with communication via air waves.

BILL: I've tried that and it surely takes much thinking.

IVAN: Yes, Bill. It also involves considerable planning and problem solving as do most projects in the industrial-arts laboratory.

MR. OGDEN: That's a big problem which we have in our plant. Many of the men simply can't plan or think out various problems which arise.

IVAN:[10] Many students derive a feeling of success and a pride of accomplishment in making a useful project. This slide shows a boy who has just completed spinning a set of aluminum coasters.

MRS. LYFORD: I can remember how proud we all were when Bill made a plastic lamp.

IVAN:[11] Here is a slide of a general shop in action. That boy on the right is making a mold in the foundry area; the girl in the center is making brass house numbers which she plans to mount on a plastic back; one is refinishing an antique chair for her grandmother; [*pointing*] that's Betty and she's forming a vase on a potter's wheel; these young people are constructing a model of Fort Recovery in connection with their American History class.

BILL [*astonished*]: Do you mean that the girls actually get to take industrial arts in the same class with the boys?

IVAN: Yes, Bill. We have one class a day for both boys and girls, we call it our orientation course.

MRS. LYFORD [*highly enthused*]: My! That's a splendid idea! I feel that many of our schools place too much emphasis on segregation. Boys and girls should be taught to work and live together. I wish

[1*]Number indicates description of slide.

that we would have had more of this where I went to school.

MR. OGDEN: The students seem to be interested and enjoying their work. Pupils need experiences of this kind. Being in a classroom all day studying Shakespeare, "algebray," and other "academic verbosity" becomes very boresome.

IVAN: Yes, it provides the student with opportunity for experience in constructive activities. Industrial arts also gives the student a wide background of trades and occupations, thus meeting to a certain degree vocational needs.

IVAN:[12] You've all probably heard of management, organization in industry with its superintendents, foremen, unit leaders. . . . This slide shows the pupil personnel organization in one of our classes. We also study how personnel organizations operate.

MR. OGDEN: Say! That is much like the setup down at the plant. There's no better way to teach students to co-operate and work together. Everyone can't expect to be a leader in our "blue collar" society but its something to be a good follower.

IVAN:[13] This is Wayne Tharp in his home workshop. Many boys become interested and develop workshops of their own. Certainly Wayne will be a respectable citizen with this home environment.

MR. HILL: I was reading the other day where Bob Burns, the comedian, Lawrence Melchior, famous opera star, and many other celebrities have home workshops in which they spend their leisure time. In fact, *Fortune* magazine, February, 1948, devoted a feature article to home workshops.

IVAN: It's the third largest hobby in the United States.

MR. OGDEN: Think I'll start one of these home workshops myself. Does it cost much money?

IVAN:[14] It all depends on how much you want to put into it. This slide shows a group of adults working in our shops in the evening. Some adults don't have the money or space for a workshop of their own, so we open the laboratory two nights a week. Such a community gathering creates many opportunities for the discussion of civic issues, too.

BILL: Could we?

IVAN:[15] You sure could, Bill. This next slide shows a group of students observing the tapping of an Open Hearth Furnace in a steel mill. This trip was part of our unit when we studied the steel industry.

MR. HILL: When I was a boy, we could watch the village blacksmith, the shoemaker, and other craftsmen at work but now that industry is so centralized, I can see where these trips might be a vital experience to students.

IVAN: Those are true words of wisdom, Mr. Hill.

BILL: What are the students doing in this slide?

IVAN:[16] They are learning to overhaul a power lawn mower. We strive to teach the student to become an intelligent consumer so that he may intelligently select, buy, use, and maintain the many products of industry.

MRS. LYFORD: That certainly is an important aspect. I'm usually at a loss when I go to purchase household appliances and Bob, my husband, knows less than I. Yet we are told that women do 85 per cent of the buying.

BILL [*laughing*]: You oughta try to see Mom replace a washer in a faucet. Wow! that's terrific!

MRS. LYFORD: Quit rubbing it in, Bill. We didn't have industrial arts in school when I was a girl.

IVAN:[17] These students are studying period furniture.

MR. OGDEN: Do you mean you actually study about the material cultures of the past?

IVAN: We do and at the same time emphasize good workmanship and design.

DON COVERT: I've been watching your slides and listening to your conversation and I've got something to say. I dropped out of school when I was in the seventh grade — didn't have much interest for bookwork. Think I'd a stayed in school if we "ud" had something like this industrial arts.

CONDUCTOR [*calling out*]: Continental City next stop. Next stop Continental City.

MR. OGDEN: Here's where I get off. Thanks so much for showing the slides and for your fine comments. I'll never call industrial arts manual training again. I'm going to investigate the industrial-arts situation in the schools of our city and see if we can be of any help. Would it be possible for you to show your slides and make a speech at our Chamber of Commerce meeting?

IVAN: I think it could be arranged. Write me. Here's my card.

MR. OGDEN [*observing the card*]: That's a fine card.

IVAN: Glad you like it. The boys printed them for me as a present in our graphic-arts area.

MRS. LYFORD [*as she prepares to leave*]: Your show was very enlightening, Mr. Attraction, but I have a question I want to ask you before I leave. My daughter is in the fourth grade and I'm wondering if such a program could be adopted on the elementary level?

IVAN: Many schools already have industrial arts on the elementary level.

MRS. LYFORD: I hate to impose upon you but could you speak to our Child Guidance Club on elementary industrial arts this summer?

IVAN: It would be a pleasure, Mrs. Lyford. Just let me know the date [*handing her his card*], time, and place of your meeting.

BILL: I'll be seeing you, Mr. Attraction.

IVAN: So long, Bill.

[*Mr. Ogden, Mrs. Lyford, and Bill exit left as Mr. Hill and Don Covert help Ivan put away his equipment.*]

MR. HILL: Young man, you really have an attraction.

Curtain

LIST OF SLIDES

Slide No.

1. Energy Output From Mineral, Fuels, & Water Power Compared With Work Animals and Humans 1850–1860. From: Dunhurst, J. Frederick and Associates, *American Needs and Resources,* Twentieth Century Fund, 1947, Appendix 32.
2. U. S. Patents 1860 — 5000; 1950 — 25,000.
3. Value of Manufactured Goods
   1860 — 2 Billion
   1950 — 74 Billion
   Railroad Increase in Mileage
   1860 — 30,000 miles
   1950 — 227,244 miles
   Automobiles
   1900 — 5,000
   1950 — 40,000,000
4. Atomic Energy Picture.
5. Total sales of a few great corporations in our free-enterprise system which have accelerated the rapid growth of industry.

	Sales, 1948
General Motors	4⅗ Billion
U. S. Steel	2½ Billion
Standard Oil	3½ Billion

6. A few of the men who have been instrumental in accelerating our technology: Ford — Hall — Edison — Westinghouse — Carnegie — Bell.
7. These rapid changes have created many problems: Labor *vs.* Management — strikes —

competition — unadjusted youth — unemployment — consumer illiteracy — increased leisure time — picketing.
8. Shows a group of students conducting a forum.
9. Shows a boy constructing a radio.
10. Shows a boy near a metal spinning lathe, who has just completed a set of aluminum coasters and is admiring his work with great pride.
11. Shows a group of students (boys and girls) working in a general shop.
12. Pupil Personnel Organization.
13. Shows a boy working in his home workshop.
14. Shows a group of adults working in an evening shop class.
15. Shows a group of students observing the tapping of an Open Hearth Furnace.
16. Students overhauling a power lawn mower.
17. Shows a group of students studying period furniture.

Furniture for the Schools

LESTER L. FEHR
Formerly Assistant to the Superintendent and
Director of Vocational and Adult Education
Allentown, Pa.
Now at Lynwood, Calif.

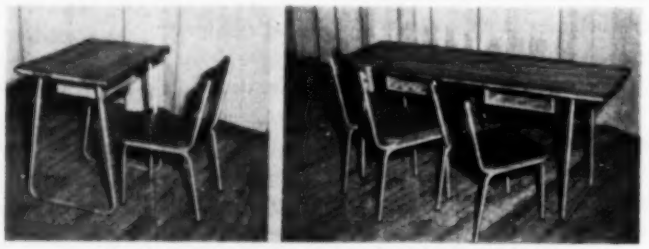
The Smith-Hughes Law states, "At least half the time for instruction be given to practical work on a useful or productive basis." The problem of providing work that is useful is answerable in a number of ways. Two of the most used ones are: first, where the student works only on articles that are for personal use and second, where the student works only on articles that are for the school.

In attempting to find an answer to this problem for the cabinetmaking and welding classes in Allentown High School, we combined these two and for 70 to 80 per cent of the school year the student works on useful and productive work for the school district and for the remaining 20 to 30 per cent, he works on articles for himself.

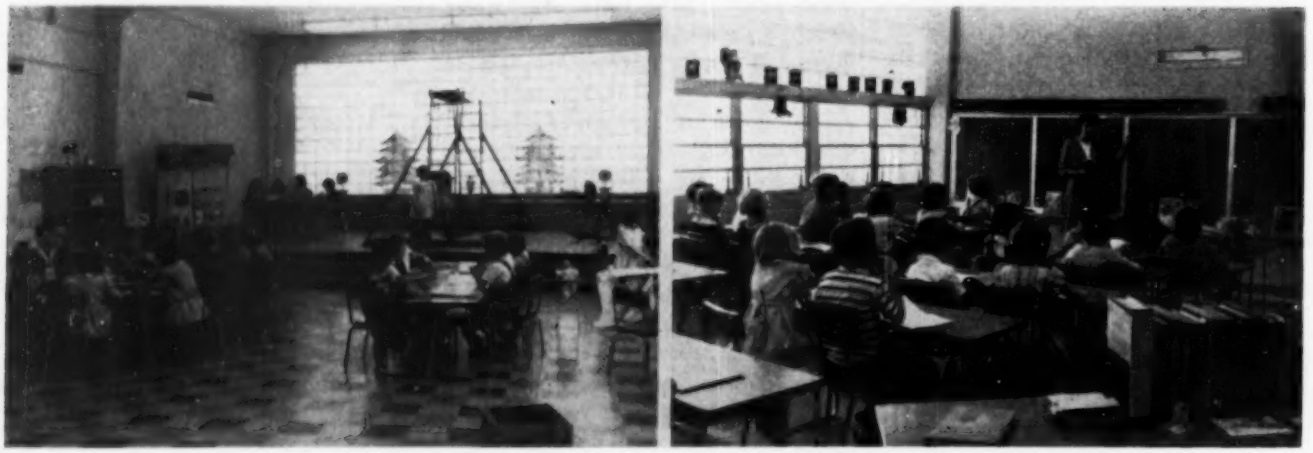
This setup makes our cabinetmaking department a real production asset to the school district. There are numerous articles needed in the schools which can be made in the school shops on a production basis. There is real value in this production as we follow industrial practices and the danger of exploitation is reduced to a minimum by a rotating scheme of work processes.

The opportunity for the vocational department to make a real contribution to the school district came with the construction of two new primary units. These are identical four-room buildings in different sections of the city of cast concrete construction. They house the kindergarten, first, second, and third grades. Thoroughly modern in all their appointments, they offered a challenge in the furnishing of the rooms. Sample chairs and tables, coat racks, lockers, book racks, and kindergarten equipment were designed, built, and submitted to the vocational department. Upon adoption, with suggested changes, the setting up of production facilities was next in order.

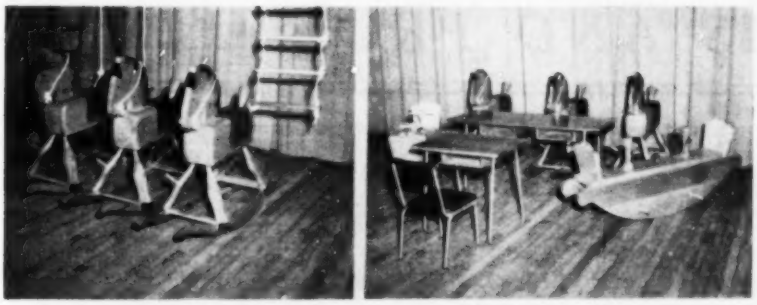
No great changes were made. The cabinetmaking and welding shops were the two units that would do the manufacturing. Jigs were devised and set up in the welding shop for chair and table frames. A tube cutter was designed and a tube bender was secured from a local machinery distributor. Tubing was purchased from War Assets until their supply was exhausted and then purchased from industrial suppliers. The tubing used is ¾-in. O.D. — .035 wall SAE 1030, with a welded seam. Seamless tubing can also be used. The bending, welding, drilling, and painting are



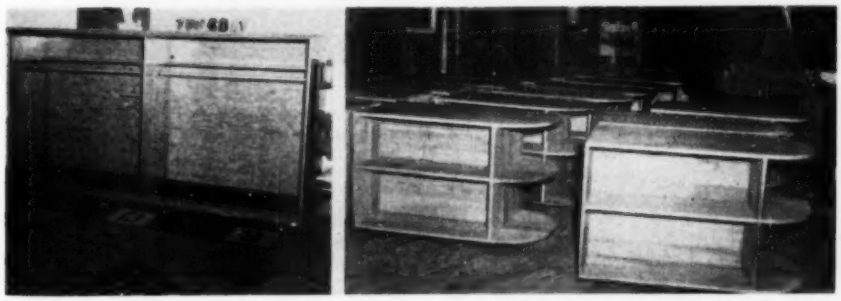
Single and double pupil desks made by the high school students of Allentown, Pa.



Kindergarten and second grade, showing equipment



Equipment for kindergarten and grades 1, 2, and 3



Portable hat racks and portable book shelves

all done by the welding students. We are now experimenting with a plating process but up to the present, the chair and table frames have been dipped in aluminum paint. To keep them looking nice, frequent retouching is necessary and this can be eliminated through a plating process.

The completed frames are then sent to the cabinetmaking department. Seats and backs are shaped and upholstered and are fastened to the chairs with screws that extend through holes drilled in the tubing. Seats are cut from ¾-in. 5-ply panel board. One side is covered with a piece of rug cushion that is glued directly to the wood and then trimmed to size. The felt and wood are then covered with a washable plastic, tacked on, in one of four different colors, depending on which grade the furniture is to be used. Kindergarten furniture is upholstered in red, first grade in blue, second grade in tan, and third grade in yellow. The backs are curved and are cut from solid blocks of glued up stock. Short pieces of stock and left-over pieces from other jobs, are glued and clamped into solid blocks of different sizes. These are then band-sawed into the size needed with the proper curve. The felt is glued on and the plastic cover tacked on with the addition of a cover strip on the back which conceals the tacks. No cover strip is needed on the seat.

A minimum amount of furniture is manufactured during the school year. The major portion is manufactured during the summer months. Instructors and pupils are employed on an hourly rate basis and real production begins. One summer's production was 500 adult size chairs and 50 tables for two junior high school cafeterias. Production during the school year is held to a minimum to prevent the charge of exploitation. Upon completion, the pieces are delivered to the buildings by school district truck.

This program has been so successful that plans are now being formulated to make most of the equipment for a new $1,800,000 junior high school now under construction. Tables, chairs, dictionary stands, costumers, projector stands, and teachers' desks are among the items to be manufactured by the vocational department for this new school.

We do not recommend that a furniture factory be set up in any school district. This is only one branch of the cabinetmaking activity. Sufficient articles for schools can be manufactured which will provide the needed useful and productive work. The teachers have entered wholeheartedly into this project. We provide custom-built furniture for our schools at a low cost, which is a contribution of vocational education to the school system. Visitors from many places are amazed at the beauty of our new schools, and surprised when they learn the equipment is homemade. It is with great pride that we in the vocational department say that every piece of equipment in the new buildings was made in our department. The attendant publicity of this contribution has resulted in increased appropriations for our courses, an expanded program of vocational education, and a feeling of pride on the part of everyone concerned that we are a vital and integral part of a comprehensive educational program designed to meet the needs of all the children of all the people.

During the five-year period 1937–41, there were 12 polio deaths for every 100 reported cases. The death rate in the succeeding five-year period, 1942–46, declined to 8 per hundred. From 1947 through 1951, there were only 6 deaths per 100 cases. The reduction is attributed to the development of improved treatment methods as well as to more accurate reporting of less serious cases. — *Public Relations Department, National Foundation for Infantile Paralysis.*

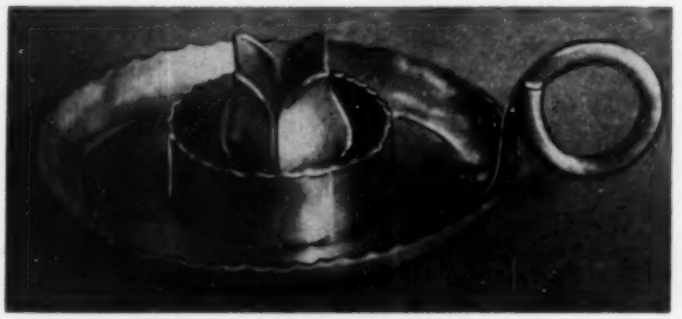
I wish I could take all teachers on a trip through the great industrial laboratories of America. What you would see of things to come would thrill you beyond conception. The chemical, plastic, electronics, food, paper, and wood industries are ready to turn out new products that will permit a standard of living beyond your fondest dreams. — *Roger M. Kyes, Vice-President, General Motors.*

America now has in its privately-owned ocean-going tanker fleet 451 vessels of nearly 6,741,000 deadweight tons. It is the world's largest tanker fleet under any one national flag. Of the tankers, all but two may be used to carry oil. The two exceptions carry propane gas and chemicals. Many of the tankers are used to carry molasses if there are slack summer months, and petroleum and petroleum products during the winter. The bulk of the tanker fleet operates in coastwise and intercoastal trade such as bringing oil from the Gulf states to eastern coastal refineries. — *Petroleum Newsnotes.*

PROBLEMS AND PROJECTS

HURRICANE LAMP

RONALD NUTTER
Instructor, General Shop
School No. 1
Passaic, N. J.



Hurricane lamp

Here is a project for general metal crafts that has a worth-while take home value and offers a challenge to the student to master several skills in the making of this hurricane lamp.

This lamp was made by eighth-grade students in art-metal work, as a beginning project. In developing the design many problems were raised by the students such as: its history, why a glass chimney was used, and a method of holding the chimney. Through research in the school library and several experimental designs, the lamp described here is of early American design without too many difficult processes in its making.

Bill of Material

1.	Small glass chimney (purchase)	
2.	Tray	5½-in. diam. 16 ga. copper
3.	Candleholder	4½-in. diam. 16 ga. copper
4.	Chimney holder	⅞ by 7 in. 16 ga. copper
5.	Handle	¼-in. diam. by 7½-in. copper rod

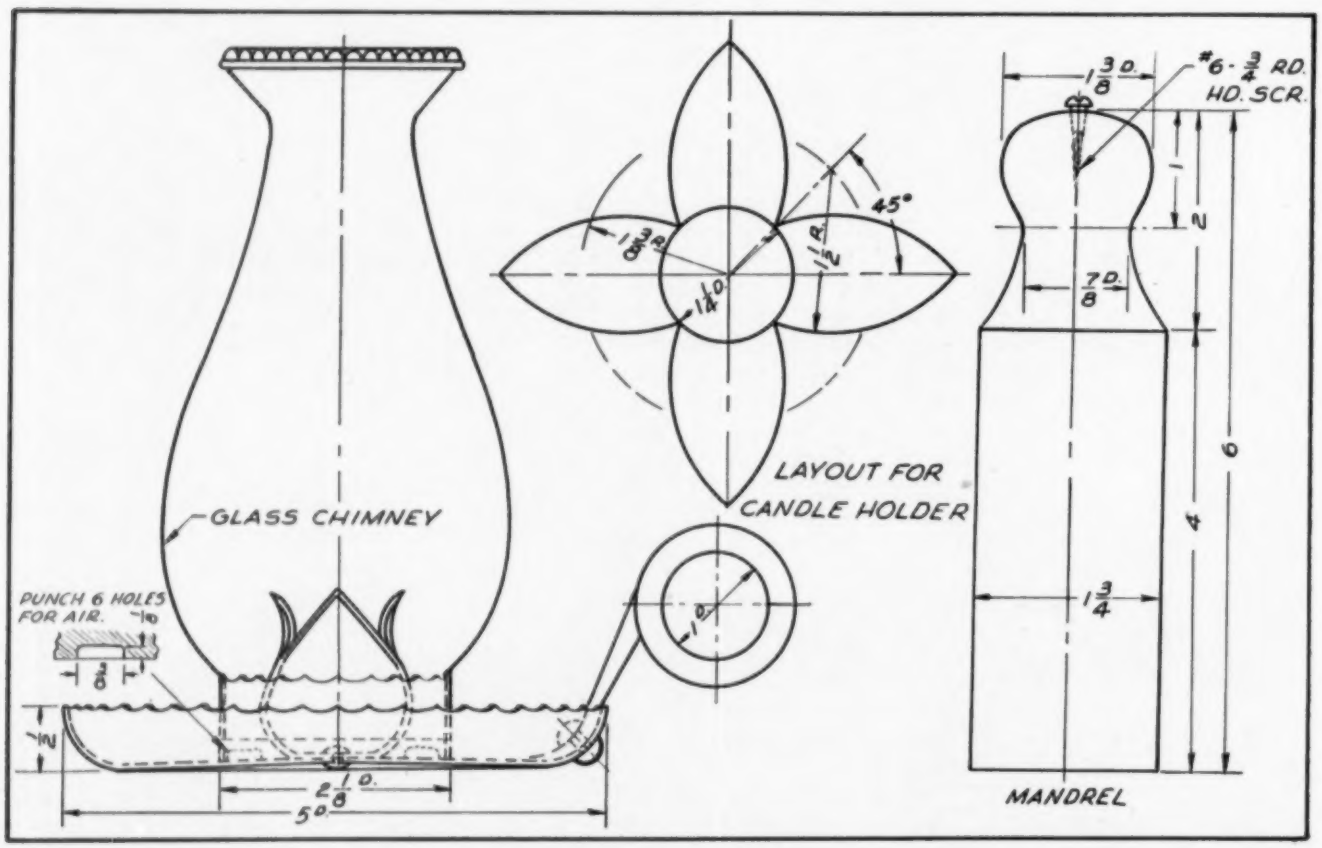
Procedure

1. Planish the copper disk used for the tray with a large smooth faced hammer on a steel backing block.

2. Anneal the tray, clean and polish with fine steel wool.

3. Place tray in a wooden mold and shape with a fiber mallet. Other ways may be used such as spinning. This will depend on equipment that is available.

4. After forming the tray serrate the edge as shown with a small half-round file.



Details of hurricane lamp

5. For the chimney holder, planish the ¾ by 7-in. strip of copper and form into a circle to fit the glass chimney.

6. Bind the circle with soft iron binding wire and solder ends together.

7. Sweat solder the circle to the tray with soft solder or by fusion using G-450 copper fit.

8. Serrate the edge of the chimney holder in the same manner as the tray.

9. Remove the binding wire and clean and polish with steel wool. If the soldering was done by fusion a very neat result will be noted.

10. Make a pattern from the layout shown for the candleholder and cut out of the 4½-in. disk. After cutting, any unevenness may be easily removed with a fine file.

11. The shaping of the candleholder was done over a wooden mandrel, turned from a piece of maple. (See sketch.) The cutout piece is annealed, then cleaned and polished. Drill a ⅛-in. diameter hole at the center and mount on the wooden form. With a small raising hammer beat the metal to conform to the shape of the mandrel. The candleholder will have to be annealed several times during this operation.

12. Remove candleholder from the form and rivet to the tray.

13. Dish the bottom of the tray slightly so that the lamp will set on a flat surface, evenly.

14. For the handle a piece of copper rod, ¼-in. diam. by 7½ in. will be needed. File taper on one end which is later riveted to the tray.

15. With a cross-peen hammer on a lead or hardwood block, peen the rod all over.

16. Anneal the rod and bend into shape around a piece of 1-in. pipe held in the vise.

17. Drill a ⅛-in. hole and rivet to tray.

18. Final operation:

Clean the finished lamp in a pickle solution made of ten parts water to one part sulphuric acid. CAUTION: Add the acid to the water slowly. Polish with fine steel wool making sure that the hands do not come in contact with any of the metal that has been polished. Use a paper towel to hold the metal for this operation.

Prepare a solution of liver of sulphur. Into a gallon of lukewarm water dissolve a small piece of liver of sulphur. Now dip the hurricane lamp quickly into this solution and out again. If a darker color than golden bronze is desired, dip again until you are satisfied as to the color. Be careful as you can easily turn the copper to a deep jet black color if dipped too many times. Some may like this deep color. After having removed the lamp from the coloring solution, rinse in clear water, wipe dry, and highlight by rubbing lightly with fine steel wool.

THRIFTY HOUSE NUMBERS

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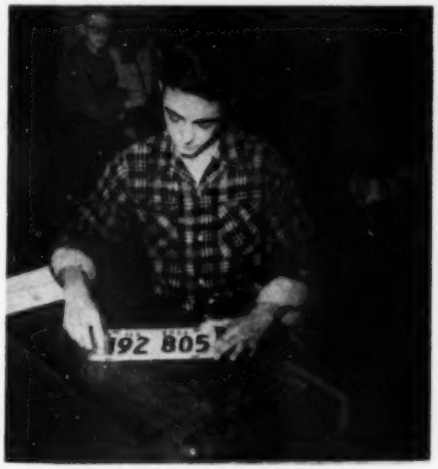
Instructor
Junior High School
Mattoon, Ill.

An age-old project, yet ever useful, they may be made from scrap wood and old license plates, preferably aluminum.



Cleaning the numbers that are to be used

As pictured the operations are especially suitable for the junior high school level. Home shop hobbyists may also find this project to their liking.

Shop classes should pool their number designs to simplify the obtaining of numbers needed to suit the individual.

Tools: Tin snips, flat file, round file, steel wool, cotton-flannel buffing wheel, buffing compound, roller, coping saw, 2/0 sandpaper, 1/16-in. hand drill, small hammer.

Plan of Procedure:

1. Cut and trim desired numbers from license plates.

The back upon which the numbers are to be mounted

Fastening the numbers in place

2. Use steel wool to clean off all dirt, grime, and paint.

3. Place numbers one at a time on a piece of scrap wood and buff to a brilliant finish.

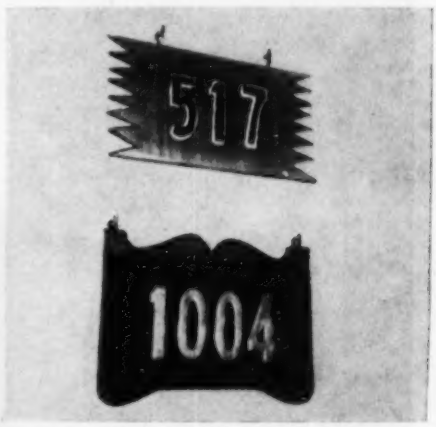
NOTE: Placing numbers on scrap wood gives support to prevent the metal from buckling under pressure. It also makes it easier to hold the numbers as they become quite warm.

4. Lay out location of holes for drilling on the back side of the numbers and drill with 1/16-in. hand drill.

5. File off any burred edges from the front side of the numbers and rebuff if needed.

6. Select a piece of wood and cut out according to pattern wanted.

7. Sand surface and edges well.



The finished project

8. Apply stain and lacquer or spar varnish.

9. Space numbers on the finished back and mount with 5/8-in. brass escutcheon pins.

NOTE: Be careful not to crush the raised portion of the numbers when assembling.

10. Space and attach screw eyes for hanging.

Unlimited backboard designs and finishes may be used. Aluminum plates are most satisfactory; however, steel plates may be used,

although they require paint or lacquer to prevent rusting. Shaped wood wall paneling makes ideal backboards.

This project has proved to be quite popular in my general shop, and serves as a good test for design as well as for demonstrating skill in working with wood and metal.

SPRAYING BOOTH AND DRYING OVEN FOR THE GENERAL SHOP

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and
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To successfully apply wrinkle finishes, as described on page 336 of the October, 1951, issue of INDUSTRIAL ARTS AND VOCATIONAL EDUCATION, it is essential that the painted object be dried rapidly after application of the paint. It is advisable to allow a 15–30 minute period before applying heat. This is

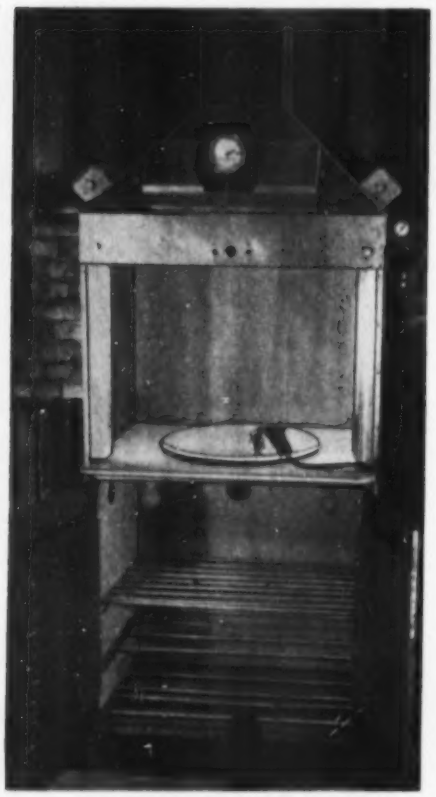

Fig. 1. A spraying booth and drying oven for the general shop

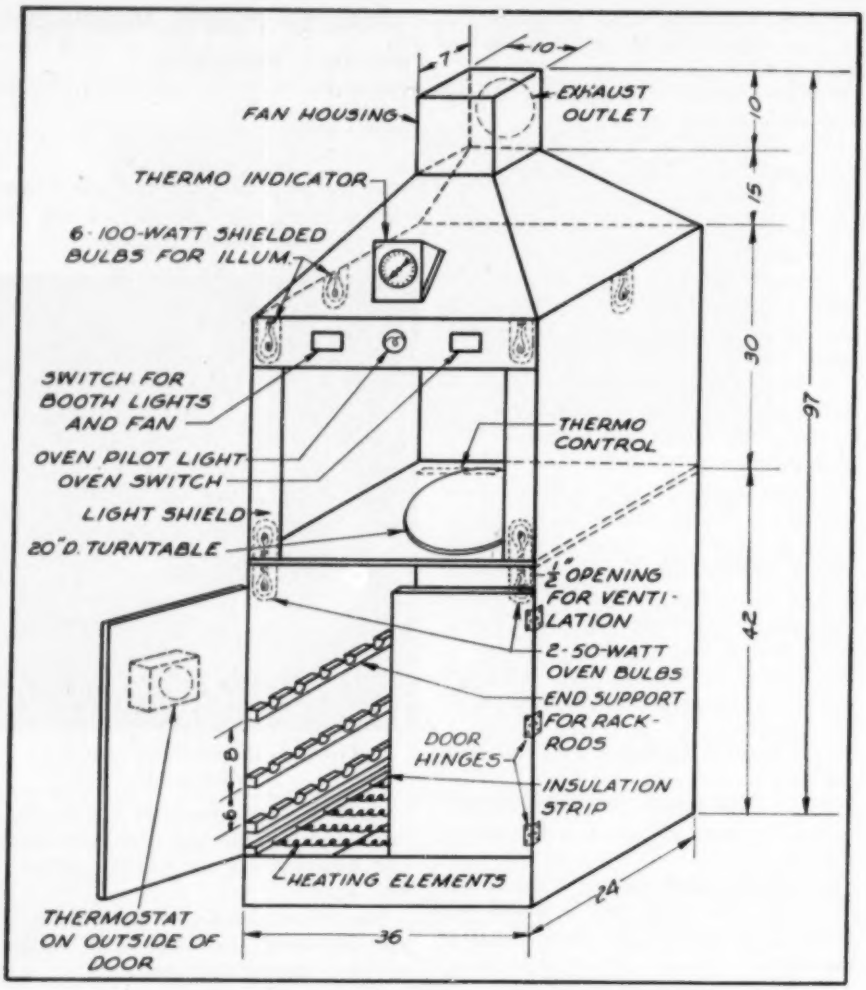

Fig. 2. Combination oven and spraying booth

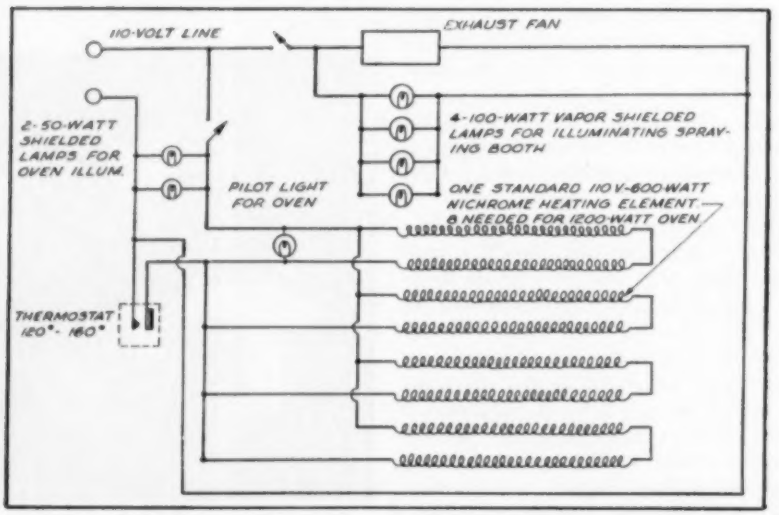
110-VOLT LINE
EXHAUST FAN
2-50-WATT SHIELDED LAMPS FOR OVEN ILLUM.
PILOT LIGHT FOR OVEN
4-100-WATT VAPOR SHIELDED LAMPS FOR ILLUMINATING SPRAYING BOOTH
ONE STANDARD 110V-600-WATT NICHROME HEATING ELEMENT 8 NEEDED FOR 1200-WATT OVEN
THERMOSTAT 120°-160°

Fig. 3. Wiring diagram for oven and spraying booth

to permit most of the thinner to evaporate, and prevent the paint sagging or running on vertical surfaces with the application of heat.

Once the heat is applied the wrinkle or texture effect becomes evident in just a few minutes, about 20–30 in most cases. The appearance will remain the same from this point on. Heat could be removed and the object very well cured and dried at room temperature. However, it is recommended that heat be applied for the length of time specified by the manufacturer. This will result in more durability and toughness of the painted surface.

The average commercial paint drying oven is quite an elaborate affair, and in most cases cannot be hoped for in the general shop, first, because of cost, and second, because it takes up too much valuable space. Commercial ovens are of two major types. The infra-red type is used largely in fast production painting. It consists of a drying area, well ventilated, surrounded on all sides with a bank of infra-red heat lamps, large in wattage, 500 to 1000 watts each, and quite close together. This infra-red heat is very penetrating and fast acting. It is not uncommon to dry painted surfaces in 10 to 20 minutes by this method, whereas, the same job of drying might take from 2–3 hours by a convection type oven. The infra-red method is quite expensive to operate as compared to the other types, but in fast production its cost is thus offset by the quantity of work turned out.

The convection type oven is still widely used in industry and this type is the one recommended for use in the general shop.

There are many variations of this type of oven. The oven described herein is built in combination with a spraying booth. The essential factors to be kept in mind when designing such an oven are:

1. Adequate lighting enclosed in vapor proof housings, and located at such points that no shadows will result.
2. A source of heat, usually electricity.
3. Adequate ventilation to carry away corrosive or explosive vapors.
4. Insulation about the walls to minimize heat losses.
5. An automatic temperature regulating device of some sort to hold the temperature within reasonable limits.
6. Large doors or openings to insert and remove articles with ease.
7. Adequate shelving which will permit ready circulation of convection currents, and which is removable for large objects.
8. A turntable for easy rotation of article being painted.

The all metal oven illustrated in this article is a combination spraying booth and low temperature drying oven constructed of aluminum. The upper portion is equipped with an exhaust fan, turntable, and illumination. In the illustrations shown in Figures 1, 2, and 3, the lower portion consists of the oven equipped with two full-sized doors and adequate removable tube type shelving. The oven is lined with asbestos excepting the doors, and heat is furnished by coils of nichrome alloy wire stretched across the bottom. A ½-in. layer of asbestos board is placed on the bottom and the nichrome coils are suspended 1 in. or more above. A thermostat circuit breaker is mounted, well enclosed, on the outside of the oven door. Caution must be taken that explosive vapors from the oven do not contact the breaker points when the circuit is broken. This oven draws 14 amperes of 110 volts a.c. which results in a sizable arc. Two vapor shielded 50 watt bulbs should be mounted inside the oven for illumination.

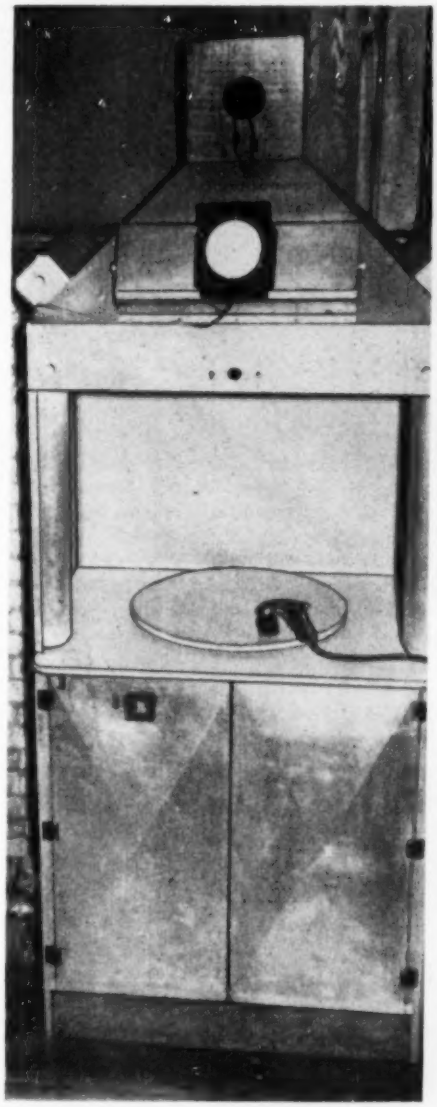

Fig. 4. A spraying booth and drying oven for the general shop

When constructing the heating coils make them twice as long as would be used for an ordinary hot plate. This will call for more wire, but it will not become red hot, will give better consistant service, and distribute the heat more evenly. The combination oven shown has four sets of coils. Each set consists of two 600 watt heating elements in series which results in 300 watts in each set, 1200 watts when the sets are paralleled, as shown in the circuit diagram. Hardware netting may be stretched over the lower shelf to eliminate the hazard of small articles falling from the shelving down onto the nichrome heating elements resulting in an electrical short. When fitting the doors allow from ¼ to ½ in. space along the top to permit heated vapors to pass out and upward where they can be drawn into the spray booth and exhausted in the usual manner. Hot vapors should be allowed to escape from the oven.

The thermostat should be set at 120 to 160 deg. F. This will eliminate any danger from burns on the oven doors, yet will be sufficient for wrinkling paint. An old 110 volt motor circuit breaker will do the job.

BRINGING PRODUCTION TECHNIQUES INTO THE SHOP

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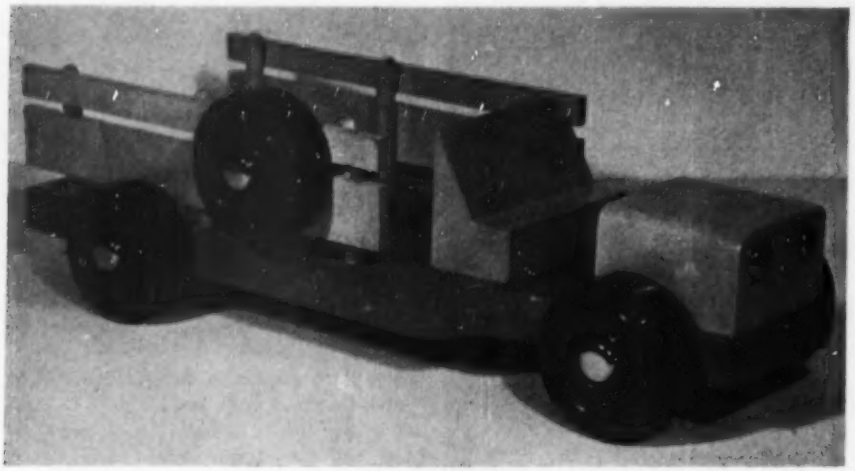
The industrial aspect of production is probably the most neglected phase of the industrial-arts program. Very few experiences are provided in the school shops for pupils to work together, each doing a specific operation toward the construction of a project. Most shops provide the machines, the materials, and many of the processes of industry, but the techniques of mass production are very seldom used. Instead the ancient practice of individual craftsmanship is rather universally in practice. Each pupil builds and custom fits all parts and competes with his neighbor.

Therefore, to bring into the shop the techniques of mass production and the experiences of working together, it is well occasionally to use a production project with a class. Every other boy in school will know all about it and will profit even though he is not actively taking part.

To begin with try to pick a project which is adaptable to production and which has boy appeal. The time of the year should also be taken into consideration. The writer found that the toy truck, introduced before Christmas, needed no selling. A completed model was shown and the enthusiasm soared. Com-



The toy truck

mittees were appointed to work out some details, such as the name of the company, the time cards, and the colors to be used in painting.

The instructor must be prepared to devote a great deal of outside time in preparing the paper work required to make the project operate smoothly. In the planning stage there is not too much opportunity to use the class's help because of their very limited background in industrial practices. Interest will lapse very rapidly if there is too much time taken up in groping for methods of getting the job done. Wherever possible use as much pupil help in planning as can efficiently be utilized. The writer found that to make the project have an industrial atmosphere everything should be planned out in advance, so that once production was started all emphasis should be toward the objective of efficient and safe production. The social studies teachers used the experience to correlate with their units of study at the time.

The Project

The Clark Toy Truck Mfg. Co. was set up by a class of 17 eighth grade boys with the objective of constructing 25 trucks. Each boy was to receive one truck, drawn by lot, and the remainder were to be given to a charitable institution of their choice. It was decided that all parts for the 25 trucks would be produced and painted before the assembly line would be set up. The only subassembly was that of the truck stakes. This was to facilitate the painting.

Machines Used. — Machine lathe, band saw, jig saw, wood lathes, drill press, and disk sander were used.

Other Devices. — Application for employment blanks were filled out first by all members of the class. A *personnel* chart was kept and all jobs were rotated every several days so that the workers had the opportunity to work in most of the departments. *Production records* were kept by each department daily. *Drawings,* pictorial and isometric, were furnished all departments with instructions for the procedure of production. *Time cards* were kept daily by each worker. A *safety chart* was kept for a record of any injuries (only one occurred). *Jigs* and *patterns* were used wherever possible to simulate production.

Organization

I. *Board of Directors (Class)*
   A. Committee selected the name.
   B. Committee worked out the time sheet.
   C. Decided to put hub caps on trucks.
   D. Decided to leave off steering wheel.

II. *Plant Foreman*
   A. With the help of the instructor, kept the men on the job.
   B. Assigned men to departments where needed and helped to rotate men.
   C. Helped solve workers' problems.

III. *Stock Dept.* Cut out rough stock and kept departments supplied from stock pile.

IV. *Body Dept.* Cut out bodies on band saw, drilled holes on drill press for stakes, drilled shank holes, sanded, sent to inspection department.

V. *Hood Dept.* Cut out hoods, sanded, drilled pilot holes, sent to inspection department.

VI. *Seat Dept.* Cut out seat, sanded, drilled pilot holes, sent to inspection department.

VII. *Wheel Dept.* Wheels were cut from prepared cylindrical stock to ¾ in. + 1/16 in. for facing. Set up wheels in a universal chuck on a machine lathe, drilled a 3/16-in. hole for the axle with tailstock, faced both sides with facing tool, cut grooves on one side with special tool, sent to inspection department.

VIII. *Dowel Dept.* Furnished ½ by ½-in. stock set up in wood lathe and turned to 3/8-in. dowel by use of doweling jig, sent to jig saw and cut into 3-in. lengths, one end rounded on disk sander, sent to inspection department.

Photo shows the paint department painting one of the stakes. Foreman's job sheet shows the colors to be used

IX. *Side Board Dept.* Boards cut + 1/16 in. in length. Sanded ends on sander, planed edges smooth, sent to inspection department.

X. *Side Board Assembly.* Received dowels and side boards from inspection, set up in jig and assembled with brads, sent to inspection.

XI. *Paint Dept.* Received parts from inspection and painted them according to the color chart.

XII. *Inspection Dept.* Checked every finished part and if O.K. sent it to paint department, or put it in storage after being painted.

The Assembly Line

After all the parts were made, painted, and O.K.'d by the inspection department, the time had arrived for their assembly. The operation was broken down into 16 steps. A chart was prepared showing all the steps in sequence and the worker assigned to each job. Each worker was given an instruction card telling him how to perform his specific operation, and the tools and supplies he would need. All 25 trucks were assembled in three 45-minute periods.

Assembly Line Operations

1. Drill rear wheel pilot holes
2. Drill front wheel pilot holes
3. Install right stake
4. Install left stake
5. Install right rear wheel
6. Install left rear wheel
7. Install right front wheel
8. Install left front wheel and oil wheels
9. Install rear hub caps
10. Install front hub caps
11. Install hood
12. Install seat
13. Install head lights
14. Inspection and foreman
15. Storage
16. Material flow

Problems Which the Instructor Encountered

1. Difficult to get pupils to fill out records each day accurately.
2. Some jobs very undesirable and some such as the machine lathe too desirable.
3. Difficult to find more than one or two good foremen.
4. Forty-five minute class periods too short.

Desirable Outcomes

1. Display of the trucks brought much praise to those who made them from their fellow pupils.
2. Publicity in local paper.
3. Letters from the hospital commending the boys on their workmanship and their humanitarian spirit.
4. A general feeling by all boys that it was a job worth doing and that it had been done well.
5. Thirty-six 35mm. color slides were taken of all the various operations; each boy appears twice, as a permanent record for the school.

PRINTING WITH ALUMINUM ETCHINGS

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Various types of the printing processes have long been recognized as desirable arts with which the general education program might be enriched. Many processes that have been advocated use simple equipment such as linoleum and woodcut blocks, dowels, spools, potatoes, carrots, and turnips cut to interesting shapes, and other unusual and inexpensive methods.

Fig. 1. Transferring the design to the metal with carbon paper

During the preholiday season and other occasions during the school year, it is natural to use any or all of these processes to produce greeting cards and decorate paper for special occasions.

Fig. 2. Paint the resist (asphaltum varnish) on those parts of the design that are to print. The resist is not to be painted on the background. Check your work by holding it in front of a mirror to see how the design will look when printed

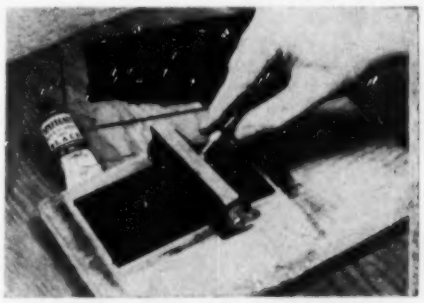


Fig. 3. Ink the plate with a brayer using regular block printing ink. Either water or oil base ink may be used. Use ink sparingly for best results

The process described in the accompanying article is interesting and worthy of merit. It is quite unusual and offers considerable promise with little additional outlay for supplies or equipment.

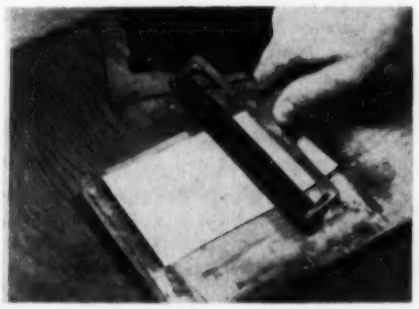


Fig. 4. Print by placing the paper on aluminum sheet and rolling it with a clean brayer

The process is a method of printing a design in which an aluminum etching is used to make the imprint. The etched background gives an effect that is desirable for many types of designs and is obtained as a result of the porousness of the material. Varying the etching speed will tend to change the texture of the background.

The process is described in the accompanying illustrations.

Fig. 5. Etching the aluminum sheet. Dilute three parts of water with one part hydrochloric acid. Safety precaution to remember: always pour the acid into the water and not the water into the acid

Fig. 6. Clean the etched aluminum sheet with benzine or turpentine. It is then ready to be used for making prints from the etched plate

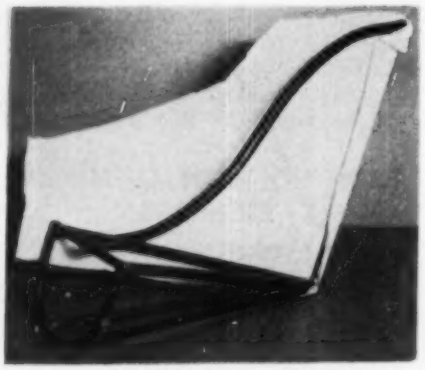


Fig. 2. When beginning the covering operation, cover the two sides first, then the bottom, and finally the front. Sponge the completely covered unit with water to remove wrinkles in the fabric

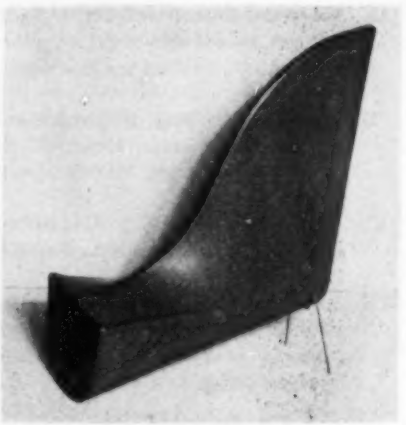


Fig. 4. The completed project with two coats clear dope brushed, two coats aluminum and three coats green pigmented dope sprayed

AIRCRAFT COVERING AND DOPING MOCK-UP

NORMAN K. RUSSELL

Assistant Professor of Industrial Education
Western Michigan College of Education
Kalamazoo, Mich.

Industrial education teachers wanting a good aviation project will find the one described herein excellent for many aircraft jobs. This one concerns welding, tube bending, covering, and doping. The project was designed by Herbert E. Ellinger, assistant professor of industrial education at Western Michigan College, Kalamazoo, Mich.

Advanced welding students made up ten of these tail sections to be used by the aircraft structures class which is part of the aircraft mechanic's curriculum. Over-all dimensions are as follows: height of fin post, 13 in.; length over-all, 13 in.; radius of front, 3½ in., and width at front 6½ in.

This small tail section is used to teach the principles of covering air frames with fabric and dope. It has an extreme convex and concave curve that at once taxes the student to put forth his whole effort if he expects to do a good job. As it is used at Western Michigan College it is covered with inexpensive cotton muslin cloth which, for all practical purposes, works as well as expensive aircraft cotton. One yard of muslin will cover the whole project. After it is covered the tail section is given one coat of dope by hand. Surface tape is cut by the student with either pinking shears or a pinking machine and applied at all corners and edges with the second coat of dope. After

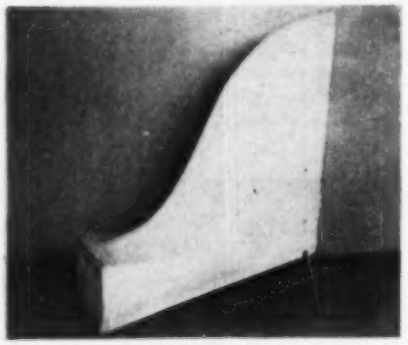


Fig. 3. The tail section covered. Surface tape has been applied at all edges and corners. The entire surface has been sanded with fine sandpaper

Fig. 1. Uncovered tail section made by the advanced welding classes. This job includes the operation of tube bending

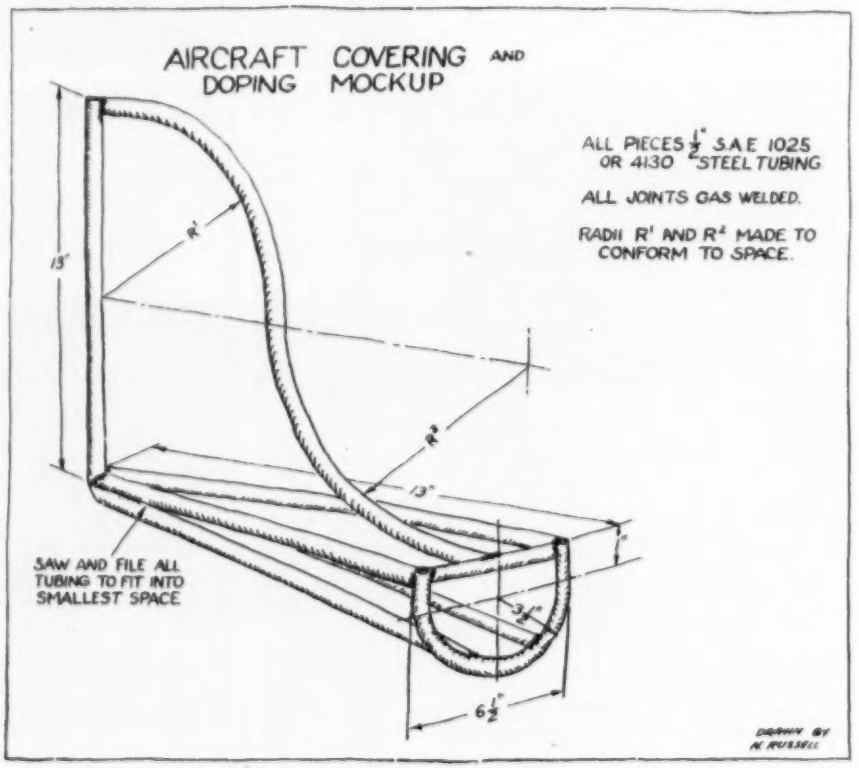


Fig. 5. Sketch of the mock-up

the second coat of dope has dried overnight the entire surface is sanded with fine sandpaper. The project is then sprayed two coats of aluminum pigmented dope to make the fabric opaque and it is finished with two or three coats of a colored pigmented dope sprayed on.

Should the instructor wish to carry the project further to include more fabric and dope operations — holes can be cut in the surface and doped or sewed patches applied. Letters and numerals can also be painted on as is often done on the fin of a real airplane.

This project has been used successfully in beginning aircraft structure classes at Western Michigan College for three years. With few exceptions it covers adequately the fundamentals of doping fabric to airframes and the techniques of brushing and spraying aircraft dope.

UNIQUE PIPE HOLDERS

GEORGE V. RADCLIFFE
Industrial Arts Education
University of Idaho
Moscow, Idaho

Pipe smokers will find these miniature furniture pipe holders readily accepted by the housekeeper. The feminine group in the crafts classes enthusiastically worked out their Dad's-Day gift problems in this manner. Furniture can be made up of one chair or in sectionals as shown in the illustration. These projects can be made into useful, colorful, and worthwhile gifts for father, husband, or boy friend, or to show off that new pipe received on your last birthday.

Cheap and inexpensive scrap materials may be used, and the construction involves the use of power equipment, hand tools, and wood carving sets. The upholstery effect may be obtained by the use of flocking in Kelly green or bright red.

Suggested Plan of Procedure and Materials

THE BOOT

1. Five pieces of ¾ by 1½ by 2½-in. scrap mahogany. Place these on top of each other and glue to three pieces of ¾ by 1½ by 5¼-in. mahogany. Clamp and let glue dry.

2. Band-saw boot into rough shape.

3. Drill ½-in. hole down front of boot 3½ in. deep. This is to cradle the stem of pipe.

4. With wood chisels, gouges, and wood carving set, work boot into desired shape. Seams may be made by the use of a wood burning set or actually carved into the wood.

5. Hollow out a 1¾ by 2-in. oval shaped depression ⅜ in. deep into the toe of boot to fit the bowl of the pipe.

6. Carve ⅝-in. wide groove into the front of the boot for the stem. Sand the entire job to a smooth finish.

7. Flocking of any color desired may be used. It is inexpensive and easily applied. Bottom of heel, sole, and seat for pipe should be covered.

8. To finish, sand, stain if desired, give wash coat of shellac and alcohol. Sand and shellac. Repeat operations until desired finish is obtained. Crocus cloth may be used instead of fine sandpaper and will help give the mahogany a beautiful luster. Boot may be shined afterward with common neutral shoe wax.

NOTE: If typical heel is used it may be necessary to weight toe of boot with lead to give proper balance. If walking heel is used no weight will be required.

Furniture — Chair or Sectional

1. Use scraps of wood. May be made of any size but should be of the following proportion: 3⅜ in. wide, 3½ in. deep, and 3⅜ in. high. Sectional sizes should be the same as for the chair.

2. Arms — ¾ by 2 by 3⅛ in. with two saw cuts equally dividing front and top. Saw kerfs are to represent cording and seams. Sand and round all kerf edges.

3. Seat — made of two pieces. Bottom or base — ⅝ by 2⅛ by 2¼ in. Cushion — ½ by 2⅛ by 2⅛ in.

4. Round edges of cushion on front, top and bottom, and both sides.

5. Glue and brad cushion to base. Cushion may extend 1/16 in.

6. With carving set or wood gouges hollow out seat for pipe bowl. Then sand. This may be done after chair has been assembled, but it can be done much easier before assembling.

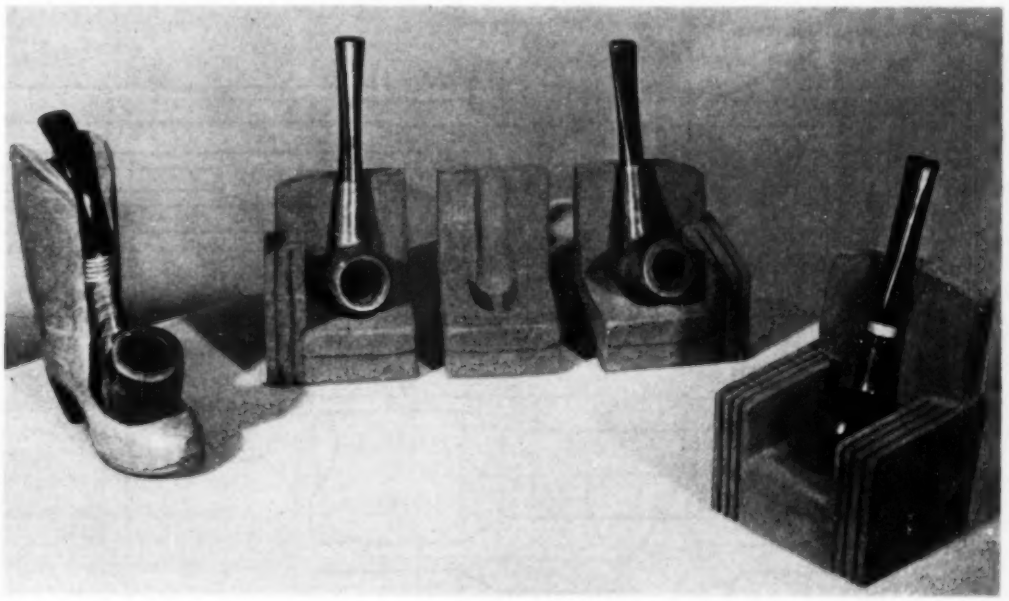
7. Mark center of back of chair and carve out ⅝ in. wide groove for pipe stem, and sand.

8. Assemble arms and back by gluing. The use of brads will eliminate clamps and waiting for glue to dry.

9. Shape back by rounding corners and all edges.

10. Seal wood with shellac and let dry.

11. Apply flocking adhesive. Enamel with



Unique pipe holders

a few drops of Japan drier may be used instead of the commercial adhesive. Apply flocking immediately. Flocking can be applied with air gun or sifted over all parts through a fine wire screen. Let dry and shake off all surplus flocking and replace in container. Chair is then ready for use.

MICROMETER READING CARDS

EDWIN K. KNECHT
High School
Irvington, N. J.

The writer has taught micrometer reading for a long time, using various methods and aids. With large classes and a few micrometers available, he felt that something more was needed for the individual student to work with than a drawing on the board, a mock-up, or a few micrometers that could be passed around the class.

At his request, the art department cut out a linoleum block representing a portion of the micrometer thimble and spindle, as shown at *A* in Figure 1. The print shop printed the cards and added the graduations. See *B*, *C*, and *D*.

These cards may be used to advantage in several ways.

1. They may be attached to a board, and each card set. Number each card. The boy can write a list of the settings and they can be checked against a key sheet.

2. The cards may be passed to members of the class and they can set the mikes by marking the cards with a pencil. After checking, the marks may be erased and the cards can be used again.

3. They can be passed to the class members already set, and the boy write in his reading.

The cards can be set accurately to three decimal points. After students have learned to set these card micrometers correctly, they can easily use the real ones and measure to four decimal places.

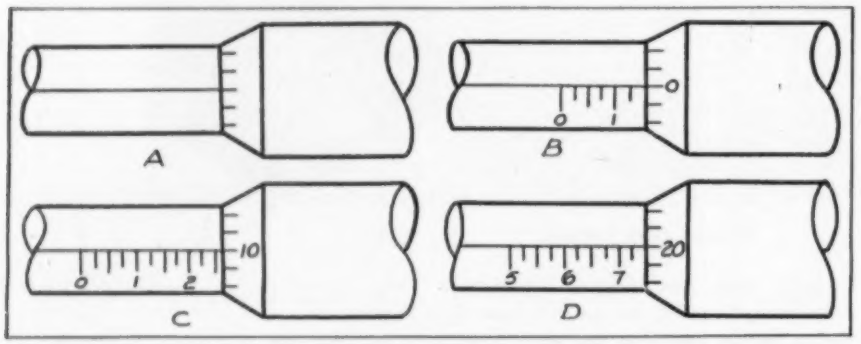


Fig. 1. Micrometer reading cards

DESK CHISEL

PERCY W. BLANDFORD
Stratford-on-Avon, England

A miniature chisel of the woodworking type has many uses on desk or drawing board. It is one of the best instruments for putting a fine point on pencils. Made with a brilliantly colored plastic handle it is an attractive and craftsmanlike item on any desk. For the student it provides an interesting project in a combination of materials.

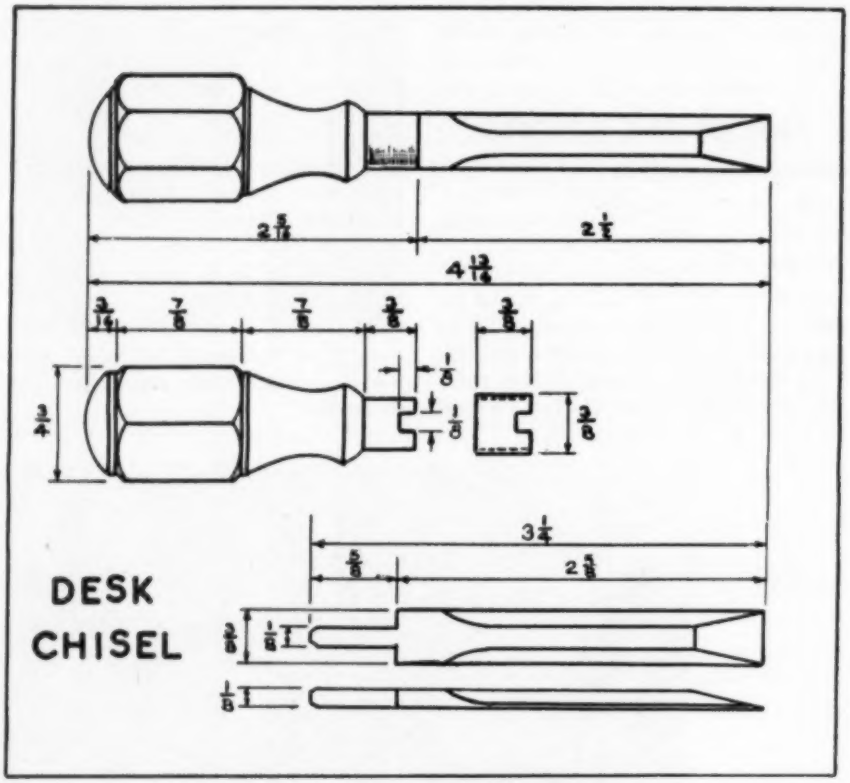
The blade is a piece of $\frac{1}{8}$ by $\frac{3}{8}$-in. tool steel. This should be annealed, then sawed and filed to shape. The tang should have a slight taper and be left rough, but all other parts should be worked to a high polish. Harden and temper to a straw color. As the tool should not get any hard use, this will take a long-lasting edge, but if the particular steel is found to be too brittle when tempered in this way, temper to a brown. In any case only about an inch of the cutting end need be tempered.

Turn a ferrule from thin-walled tube, of $\frac{3}{8}$-in. outside diameter. Brass will do, but stainless steel or plated brass will improve the appearance of the article.

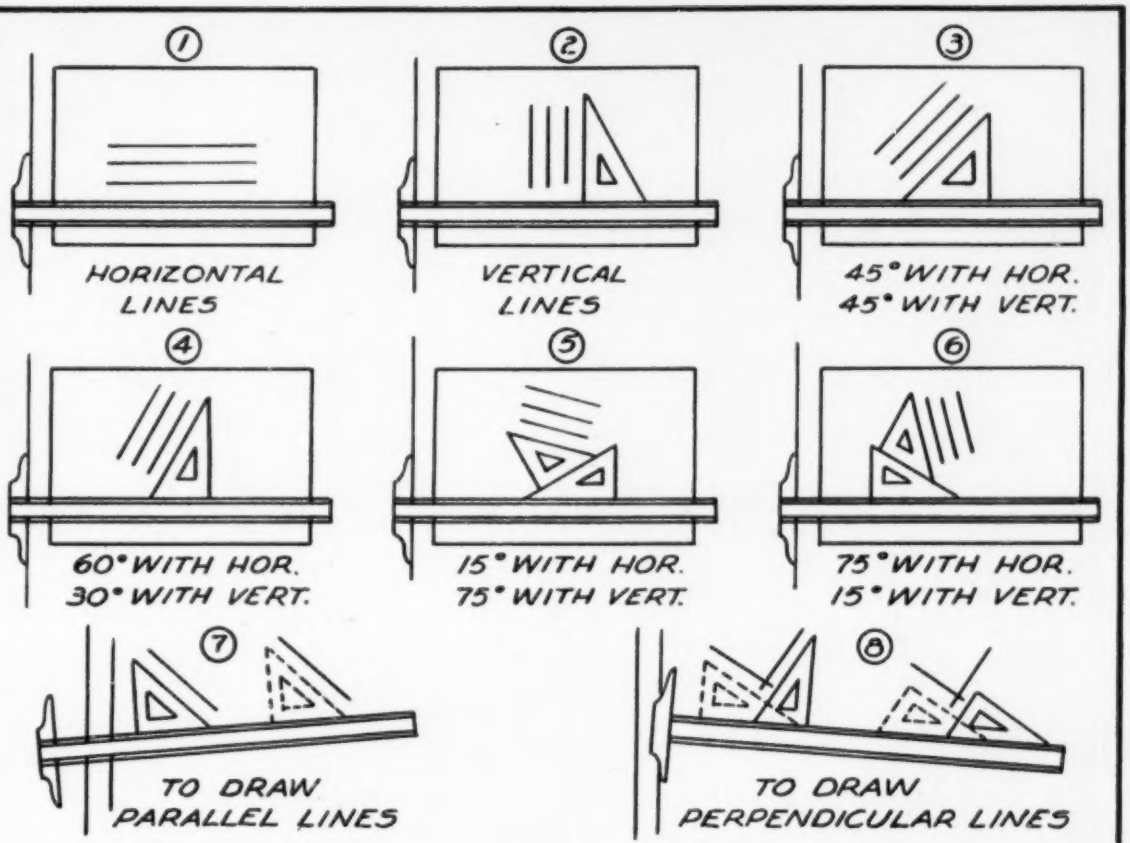
The handle is a piece of brightly-colored hexagonal or octagonal Catalin rod. Turn to size, making the ferrule a push-fit on the end. Drill for the tang, making the hole about $\frac{1}{4}$ in. too deep and very slightly undersize. Saw and file the slot across the ferrule and plastic to suit the end of the blade.

Polish the plastic. Soften it by immersing in boiling water for about three minutes, then with the ferrule in position, press the tang in. This should go with hand pressure or very light tapping. If it does not, thin the tang slightly. After cooling, the plastic will grip the blade securely.

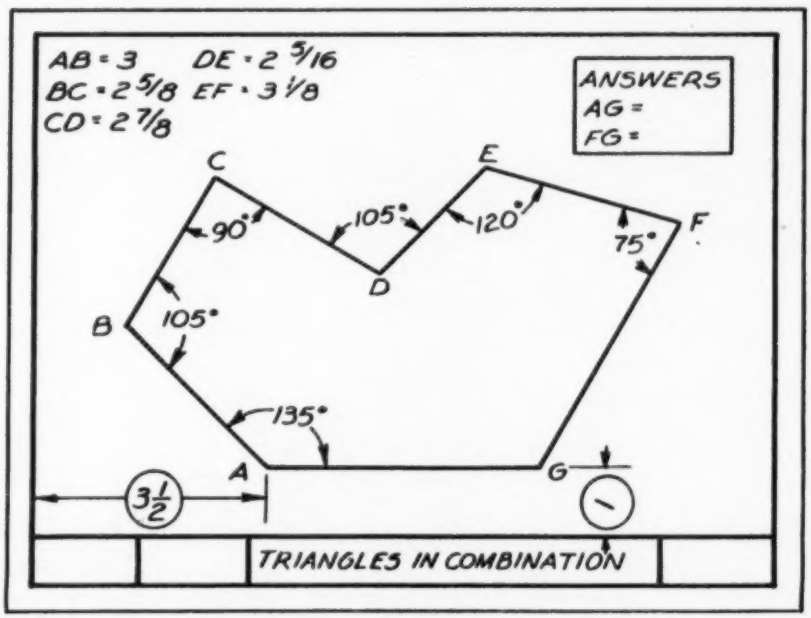
Complete the chisel by finally polishing the handle, and sharpening the cutting edge on an oilstone.



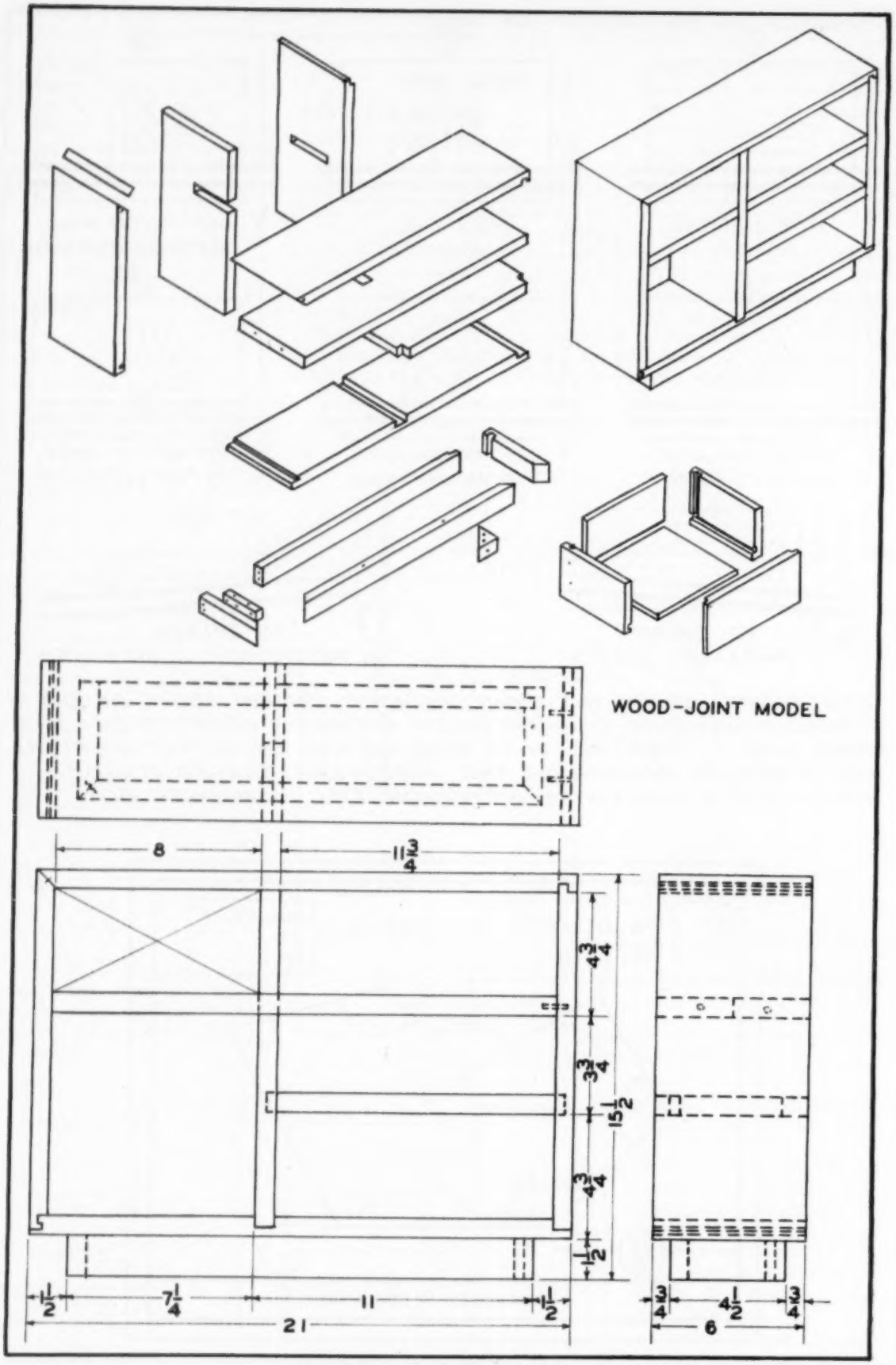
Desk chisel by Percy W. Blandford



DIRECTIONS: STUDY THE EIGHT DIAGRAMS SHOWN ABOVE. BELOW IS A SCALED DRAWING OF A PROBLEM PROPERLY LOCATED ON A 9×12 WORK SHEET. STARTING WITH SIDE, AB, AND USING THE APPROPRIATE TRIANGLES, CONSTRUCT THE IRREGULAR-SHAPED POLYGON, WORKING IN A CLOCKWISE DIRECTION. FILL IN ANSWER BOX.



Presentation of a practical problem for the drafting and mathematics classes.
Andrew G. Lofgren, Technical High School, Boston, Mass.



Wood-joint model by Lewis K. John

WOOD-JOINT MODEL

LEWIS K. JOHN
Oxnard, Calif.

Instructors who have had difficulties in teaching students in the woodshop the use and construction of the common wood joints, will find that the small model described herein to be, at least a partial answer to their problem.

This model not only illustrates the proper construction of the joint, but also serves as a guide to the various joints most adaptable to a particular use. It will be noted in the accompanying illustration that drawer construction, base construction, and cabinet construction are illustrated in the model.

The cabinet is constructed of 1 by 6-in. stock and may be painted to emphasize the joints or may be finished in a clear finish. The joints should be made to fit easily, but not a forced fit. Dowels, nails, and screws are made to fit loosely so that they may be assembled and disassembled easily.

By starting the model as a *knocked down* affair, and building it up from the base, the students will soon name the joints as they are put together. Through the use of this model, students learn very readily. It can be used in a test of joint identification after a group presentation and review has been given. Students will refer to it many times to check on its construction when they are in need of help.

The model may be disassembled when not in use and stacked away very compactly. However, it will undoubtedly soon find a permanent place in your shop.

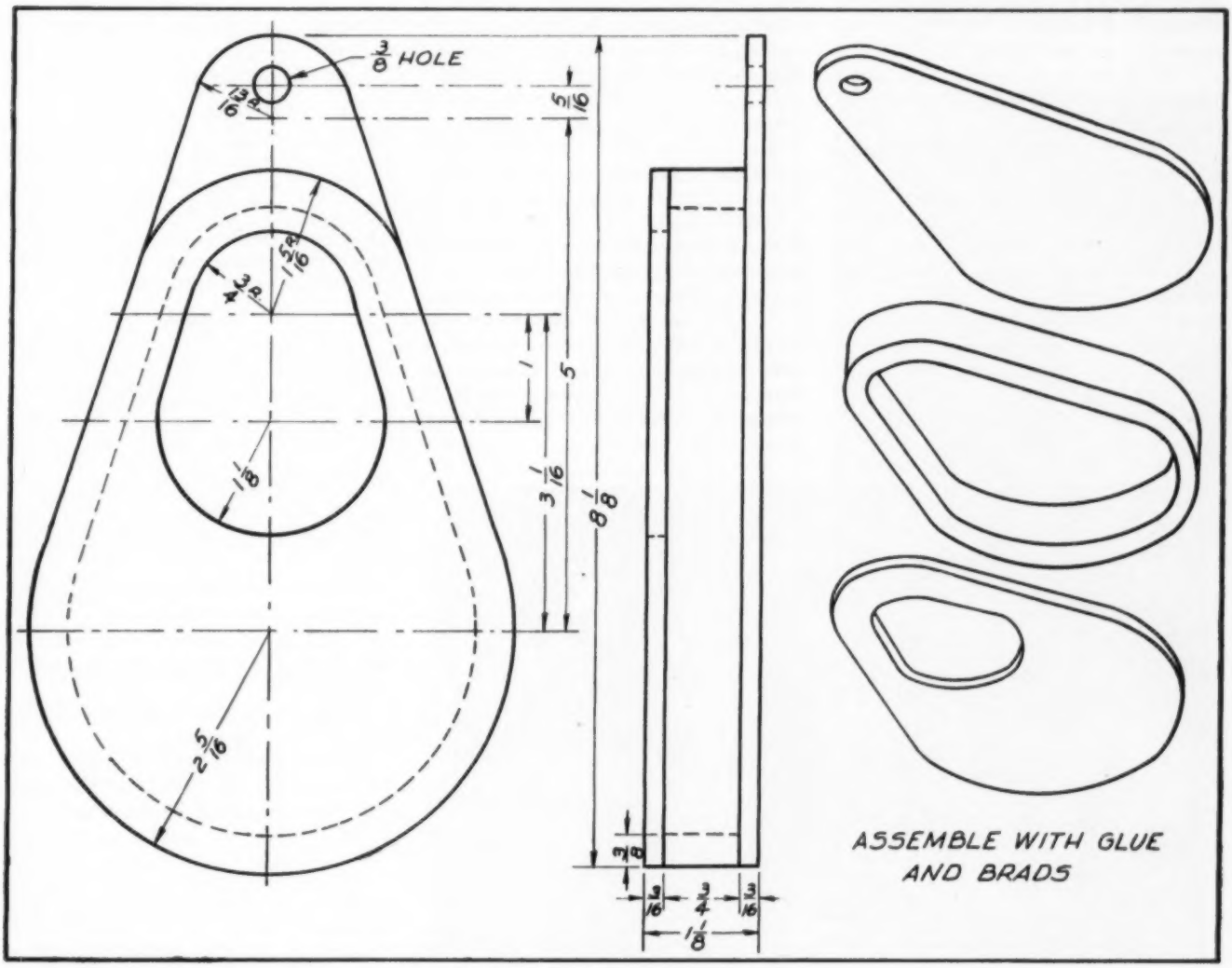
Once, only 10 to 20 per cent of each barrel of crude oil could be converted to gasoline. Now, as a result of technology and scientific research in the oil industry, almost half of every barrel can be turned to gasoline, and that amount can be increased if the need arises. — *Petroleum Newsnotes.*

HANDY NAIL AND SCREW DISPENSER

R. D. RUTHERFORD
Woodwork Instructor
Grover Cleveland Junior High School
Tulsa, Okla.

Do you have a problem of waste when dispensing nails, screws, or brads with junior high school students? If so, you may be interested in this type of dispenser which has proved very effective in our junior high school woodwork classes.

This dispenser can be made of plywood very easily. The top and bottom may be made of 3/16-in. plywood and the center section of 3/4-in. or 1-in. plywood. Nail and glue the parts together. Finish naturally or paint to suit the color scheme in your shop.



Handy nail and screw dispenser

THE YO-YO ON THE ASSEMBLY LINE

WILLIAM C. ROCHELLE

Industrial Arts Instructor
Washington Irving Junior High School
Schenectady, N. Y.

The Up and Down Yo-Yo Co. started operations on November 17, 1952, in the comprehensive general shop at Washington Irving Junior High School, as a result of a request by the local chapter of the American Red Cross for one hundred small toys to be sent to youngsters in the Azores as Christmas gifts.

After discussing the invitation with the boys in the ninth-grade classes, we accepted the responsibility because we felt it was a splendid opportunity to enter into a bond of friendship with the boys and girls of another country.

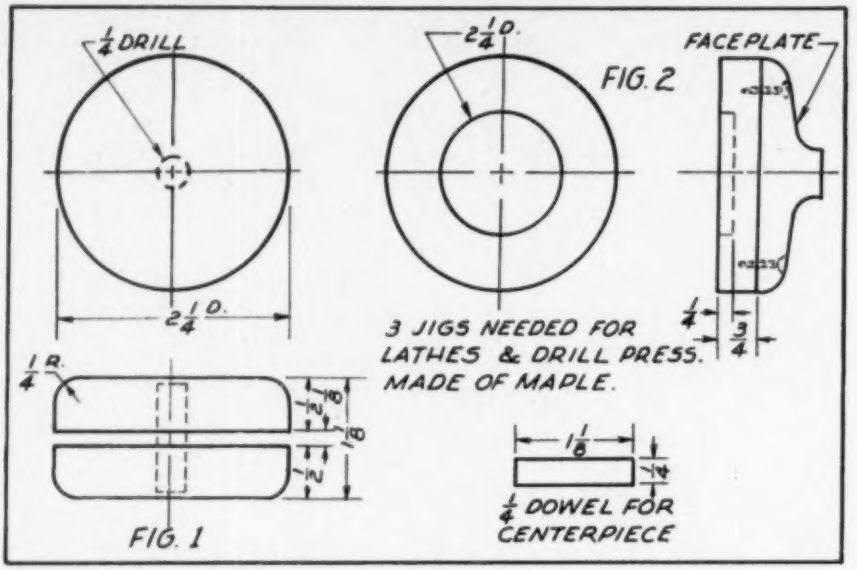
The next step was to decide what toy should be made and what method should be employed in making it. The Yo-yo was chosen for two basic reasons:

1. The name Yo-yo to junior high school youngsters is motivation enough. The appeal is universal.

2. The Yo-yo lends itself perfectly to the assembly line.

The assembly line or mass production procedure seemed the logical one.

Being located in a highly industrialized center with the General Electric Co. and the American Locomotive Co. employing a vast majority of the population, we have adopted the policy of having each ninth-grade class work on a production job for several days to become familiar with production line practices. This project would fit in perfectly with that phase of our industrial-arts program.



Details of Yo-yo, and jig for making it

Having decided on the project and the method, the construction of the Yo-yo was broken down into 15 operations, using a total of 35 boys in the over-all program. Six class periods of 45 minutes each, two afternoons after school, and one evening after supper were spent in the completion of 140 Yo-yo's. This meant a total of 12 working hours. The cost of the entire project was $25 or 18 cents per Yo-yo. Almost every scrap could be utilized, as all parts were small.

Enough Yo-yo's were made so that every boy working on the line was able to have one for himself. This, of course, was an added incentive which greatly simplified the teaching of the many operations and the presentation of the related information involved in the construction.

The jigs shown in Figure 2 were made from short ends of ¾-in. maple, and left on the face plate for the assembly line operations.

TOOLS AND MATERIALS

Compass or templet, jig saw or band saw, disk sander, wood lathes (two desirable, one necessary), drill press, 2 coping saws, 4 rulers, pencils, glue, 2 light mallets, belt sander, assorted sandpaper, shellac, 3 jigs for lathes and drill press, cans of spray paint, assorted colors, Yo-yo string, lumber — ½ in. White Wood, quantity depending on number of Yo-yo's to be made.

Procedure

1. Lay out 2¼-in. diameter circles, and cut to size using jig saw or band saw.

2. Sand to line using disk sander.

3. Pencil gauge a line ¼ in. from either face on edge of piece. Also on one face ¼ in. from edge.

4. Turn curved edge to both pencil lines using special jig to center and hold. Piece should be held tightly between jig and tailstock.

5. Sand curved edge on lathe using special jig to center and hold piece.

6. Drill ¼-in. diameter hole in center of disk using special jig clamped on table of drill press.

7. Cut ¼-in. dowel to lengths of 1⅛ in. for use as center piece.

8. Place a small amount of glue in ¼-in. hole of the two side pieces, and drive dowel into holes using a light wood or leather mallet.

9. Allow glue to dry.

10. Sand both faces on belt sander to remove excess dowel and glue. Use 2/0 sanding belt.

11. Hand sand assembled Yo-yo to remove any remaining marks.

Sanding and painting the Yo-yo

12. Inspect assembled Yo-yo for accurate workmanship.

13. Apply a wash coat of shellac. Sand shellac coat when dry and spray with cans of enamel paint spray.

14. Attach strings to finished piece. Either homemade strings or purchased regulation Yo-yo strings will be satisfactory.

15. Final inspection and testing.

Outcomes of Program

The true value of such a program can best be pointed out by listing a few of the many worth-while results, some of which were pointed out by the students working on the project.

1. We did something for other kids less fortunate than we.

2. We had an opportunity to serve our community through a charitable organization.

3. We learned the importance of working together to get a job done.

4. We saw the effects of slowdowns, breakdowns, and strikes.

5. We experienced the methods of American industry.

6. We learned that proper planning is a must in industry.

7. We saw leadership qualities develop through this type of project.

8. We practiced safety in industry, which is of primary importance.

Two classes visited our plant and were taken on conducted tours of the line. These visitors were from another industrial-arts shop. Upon returning to their class, they were so enthusiastic about what they had seen, that they immediately started planning an assembly line project of their own. As this is being written, that class has organized and is in the process of producing copper candlestick holders.

The writer once read that a production project is a real adventure. We here at Washington Irving agree, and would be very happy to open the doors to the Up and Down Yo-Yo Co. in the future for a glimpse at American industry.

CORRELATING INDUSTRIAL ARTS WITH THE ACADEMIC STUDIES

WILLIAM R. WRIGHT
Industrial Arts Department
Wanamassa School
Wanamassa, N. J.

When a student enrolls in our industrial-arts program we try to correlate his everyday academic studies with a practical art of everyday experiences.

One method used with considerable success has been for the students to write a *true confession* when they have finished their practical-art project.

This *true confession* consists of:

a) Student's name and the name of their project.

b) A list of processes or procedures used in completing their project.

c) A list of things they did wrong while working on their projects.

This little essay serves in many ways to help both the instructor as well as the student.

When a child fully realizes his procedures and mistakes, and with the instructor's help, makes his corrections, then he has been through a real learning situation.

On the completion of the student's second project and his *true confession*, his first confession is taken from the file and compared with the second one. Theoretically, the student should not have made the same mistakes in his second project that he had in the first. If he did, then we look for a source of trouble that has caused this. In short, we find where we can help him and do the most good.

One must remember that this *true confession* has many uses, and we must get the most out of a useful thing.

Now that we see how we can use it to further the cause of shopwork, let us look at it from the academic viewpoint.

When a student writes his *true confession*, he should use correct spelling, good grammar, and the correct phrasing of his ideas. Also, the instructor can help him on his penmanship and neatness.

This system has been used very successfully with beginning students in industrial-arts work. It helps to direct the attention of the teacher and the pupil to the weaknesses of a given course.

Some shop teachers may think that is an unnecessary amount of extra work to bring upon oneself, but if we are not in the teaching field to do our utmost in furthering education, then we have chosen the wrong vocation. To the writer it seems well worth the added effort. It has paid dividends.

ICE FISHING REEL

R. C. SHAW
Escanaba, Mich.

Fishing through the ice is a rather cool sport. It is difficult to keep your hands dry and the fish line from tangling. The depth of the water varies in some lakes from twenty to eighty feet and some kind of a device is needed to take care of this length of line.

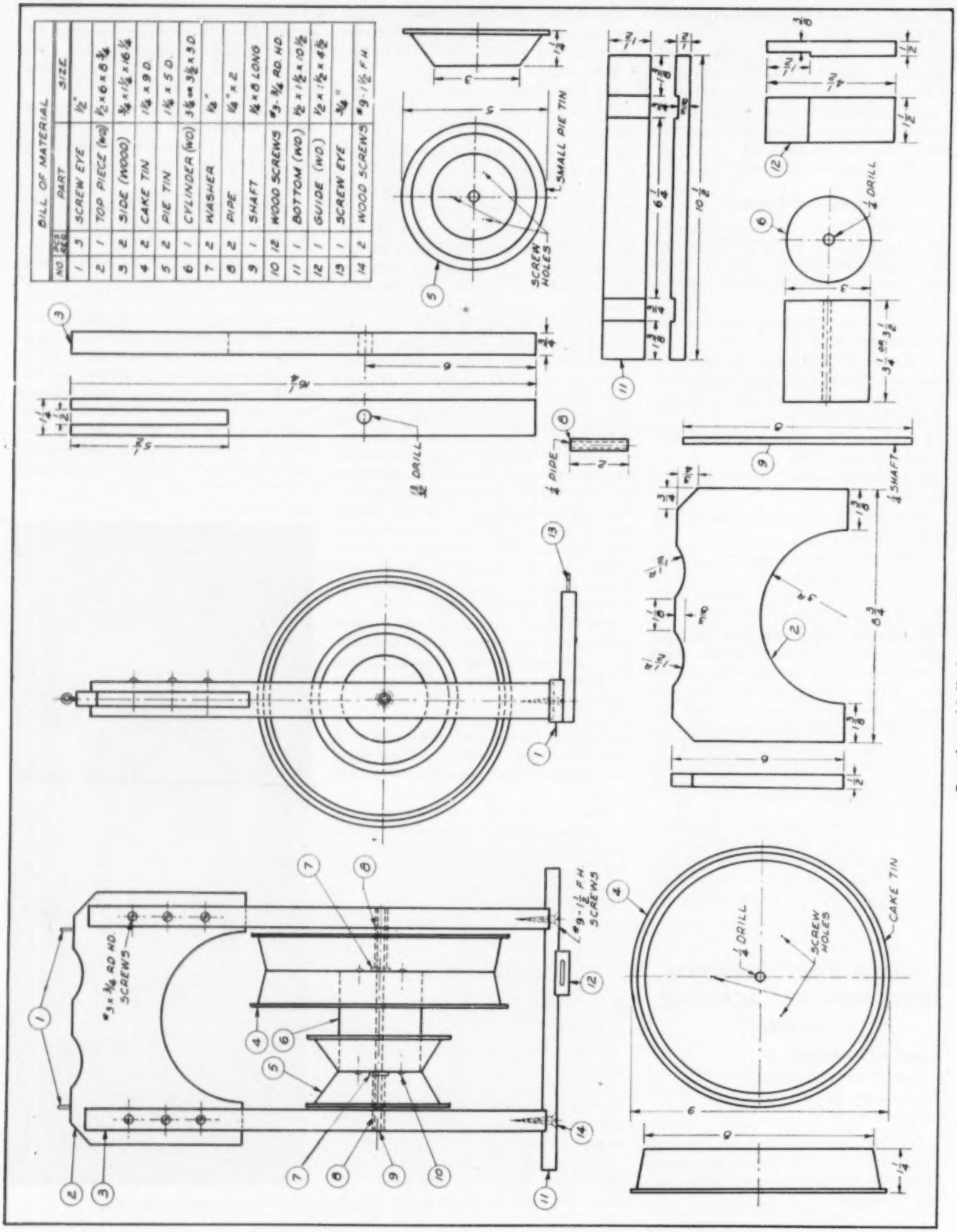
The reel has two lines — a heavy short one and the long fishing line. The short line is about one third the length of the long line and is fastened to a small wheel to operate the reel. The short hand line is never in the water. This keeps the hands dry, and a big wheel takes care of the long fishing line and keeps it from tangling.

A hollow cork or bobber can be used or you can fish with line only. It operates best in a fishing shack and in some states fishing shacks are not lawful, but a tripod on the ice works well.

The reel is used to take smelt, perch, herring, and walleyed pike in Lake Michigan and adds much to the pleasure of ice fishing.

The reel can be made of any kind of wood, but hardwood is preferred. The bearings are two ¼ by 2-in. pipes with a ¼ by 3-in. shaft. The shaft can be a ¾-in. welding rod. The large wheel is made by soldering two 9-in. cake pans together, and the small wheel for the hand line is made by soldering two 5-in. pie tins together. The 3-in. cylinder is turned and bored on the lathe. The line guides are ¾-in. screw eyes and suspend the reel. The parts are assembled with Weldwood Glue and screws. This is a fine high school shop project and one of interest to boys.

Ice fishing reel


BILL OF MATERIAL
NO | PCS REQ | PART | SIZE
1 | 3 | SCREW EYE | ½"
2 | 1 | TOP PIECE (WD) | ½ x 6 x 8¾
3 | 2 | SIDE (WOOD) | ¾ x 1½ x 16½
4 | 2 | CAKE TIN | 1⅛ x 9 D.
5 | 2 | PIE TIN | 1⅛ x 5 D.
6 | 1 | CYLINDER (WD) | 3½ — 3½ x 3 D.
7 | 2 | WASHER | ½"
8 | 2 | PIPE | ¼" x 2
9 | 1 | SHAFT | ¼ x 8 LONG
10 | 12 | WOOD SCREWS | #3 - ¾ RD HD.
11 | 1 | BOTTOM (WD) | ½ x 1½ x 10½
12 | 1 | GUIDE (WD) | ½ x 1½ x 4½
13 | 1 | SCREW EYE | ¾"
14 | 2 | WOOD SCREWS | #9 - 1½ F H
SMALL PIE TIN
SCREW HOLES
¼ DRILL
¼ PIPE
¼ SHAFT
#3 x ¾ RD HD SCREWS
#9 - 1½ F H SCREWS
CAKE TIN

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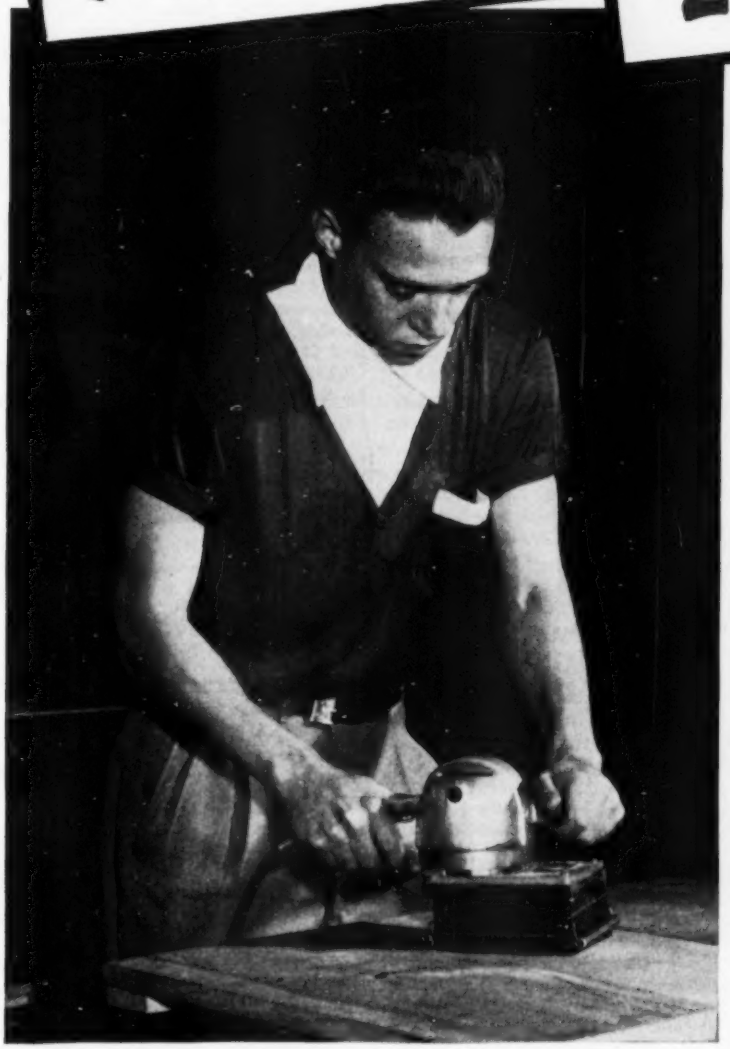

You'll find students more confident—quicker to learn—when you use a SKIL Oscillating Sander in vocational training classes. For these great tools feature ease of handling—faster operation—satin-smooth finishes on all materials, whether wood, metal or composition.

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ASSOCIATION NEWS

(Continued from page 8A)

for Industrial Arts Teachers." Included are discussions on adult programs, teacher workshops, shop planning, design, and safety. The Ladies' Program is also included for Friday afternoon. —*Wm. R. Mason, President.*

♦ The members of the industrial-arts department and Epsilon Pi Tau Fraternity of Northern Illinois State Teachers College, De Kalb, Ill., held an all-day and evening conference, discussion, and banquet program on Saturday, March 7. This program was held in conjunction with "The Second Annual Congress of Classroom Teachers." The complete program follows:

The program started at 8:30 a.m., with a coffee hour and registration. At the general session at nine o'clock, Dr. Harold C. Hunt, superintendent of schools, Chicago, spoke on "The Classroom Teacher — Focal Point of Education."

At 10:30 a.m., a panel discussion group under the chairmanship of Milo Oakland, considered "Current Problems in Industrial Arts."

At 2:00 p.m. there was a continuation of the morning's discussion.

The Epsilon Pi Tau banquet was held at 6:00 p.m. Dr. Wilbur A. Yauch, head of the department of education, Northern Illinois State Teachers College at De Kalb, was the speaker. — *Paul E. Harrison.*

♦ The Pennsylvania Industrial Arts Teachers Professional Association will hold its "Men of Industry Night" on March 25, 1953.

♦ New officers of the Iowa Vocational Association are: Marlene Nelson, Ames, Iowa, president; Ralph W. Gruenwald, Tipton, vice-president; and Mark Z. Hendren, Des Moines, secretary-treasurer.

♦ Officers of the Florida Vocational Agriculture Teachers Association for 1953 are: M. R. Avery, president; Grover C. Howell, executive secretary; Herbert E. Brown, secretary; and Harvey T. Paulk, treasurer.

♦ The Missouri Industrial Education Annual Spring Conference is to be held April 17 and 18 on the campus of the University of Missouri, Columbia, Mo.

Dr. Verne C. Fryklund, president, The Stout Institute, Menomonie, Wis., and Dewey F. Barich, manager, Educational Services, Ford Motor Company, will address the members of the conference. — *H. H. London.*

♦ Officers for the year 1953 of the Kansas Vocational Association are: Kenneth Henderson, Garden City, president; Elizabeth Hirschler, vice-president for home economics; H. A. Starkey, Green Bend, vice-president for industrial education; Max Stalcup, Lawrence, vice-president for business education; and F. E. Carpenter, Topeka, secretary-treasurer.

♦ The first annual meeting of the Colorado Industrial Arts Association will be held in Greeley at Colorado State College of Education, Saturday, April 25.

The morning session will be devoted to a business session including adoption of an association constitution.

Dr. S. R. Toussaint of Colorado State College of Education will address a meeting at the Tea House at noon where he will present his famous talk, "Community U.S.A."

Prof. E. E. Ericson of Santa Barbara, Calif., a long-time leader in the industrial-arts field, author of several books and numerous magazine articles, will headline the afternoon program. In December he was the recipient of The Ship's Citation award at the American Vocational Association convention in Boston.

♦ An Industrial Education Conference was held on March 20 and 21, 1953, at Arkansas A. & M. College, College Heights, Ark.

The conference started with a dinner served cafeteria style at five o'clock, Friday, March 20.

An open forum discussion, led by Fred Graham, assistant superintendent and director of industrial education, Little Rock Public Schools, started at 6:30 p.m. The subject of this discussion was "Problems of the General Shop."

At 8:00 p.m. Dr. Chris H. Groneman, head, industrial education department, Texas A. & M. College, College Station, Tex., spoke on "Industrial Education in the South."

The Saturday morning session opened at 8:00 a.m., with an open forum discussion led by Jack Kraras, drafting instructor at Pine Bluff High School, on "Problems of First Year Drawing," including "Drawing and Its Relation to All Shop Work."

At 9:00 a.m., there were several demonstrations. The first one was by the Rockwell Mfg. Co., Delta Tool Division, "Machines to Be Selected." John Claude, special school representative, and Frank Goodman, Delta representative, Memphis, Tenn., presented this.

The next one was on "Leather Tooling and Carving" by Henry Fears, graduate student, Texas A. & M. College, College Station, Tex.

The third one, "Metal Foil Tooling," was given by a student of Arkansas A. & M. College Industrial Education Department.

Finally, "Special Uses of the Table Saw" was presented by a student of Arkansas A. & M. College Industrial Education Department.

A tour of Ward Bros. Mfg. Co., manufacturers of boats and fans, followed.

At the noon luncheon Dr. Chris H. Groneman spoke on "Challenges Confronting Industrial Education," after which the business meeting was held.

Personal News

DELBERT A. DYKE

Prof. Delbert A. Dyke has recently assumed his duties at the Sul Ross State College, Alpine, Texas, succeeding Victor J. Smith who has retired to devote his time to architectural practice.

Mr. Dyke came to Texas from the Middle Tennessee State College where he has been teaching in the industrial arts department since 1947. In 1936 Prof. Dyke was graduated from the Oklahoma A. & M. College, taking his M.A. degree from the same institution in 1941. Some of his doctorate has been completed at Peabody.

Mr. Dyke has experienced a rich and varied service in the industrial-arts field including five years in junior high school, followed by several years in the navy technical and combat programs. He returned to the Oklahoma A. & M. as woodworking instructor after the war.

During 1947 Mr. Dyke transferred to Tennessee as instructor in metalworking industries. He has been active in the A.I.A.A.; the Industrial Arts Award program; his State Educational Associations; and in the activities of his college Industrial Arts Club. This Club presented him with a

(Continued on page 20A)

Here's the 16mm. projector you never have to oil!

As you can see from the comments below, Audio-Visual experts agree that the biggest single cause of projector breakdowns is *improper lubrication.* But though improper lubrication *can* be the source of costly and time-consuming damage, it can *never* be a problem with the Pageant. *For the Kodascope Pageant Sound Projector is permanently prelubricated at the factory!*

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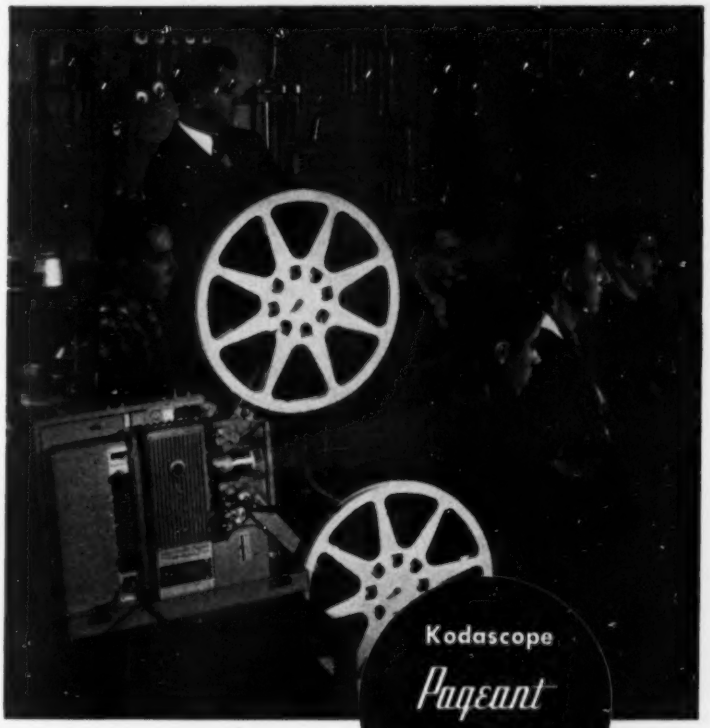

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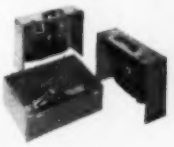

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PERSONAL NEWS

(Continued from page 18A)

watch as he completed his plans to transfer to Texas. At the Sul Ross College Prof. Dyke will have charge of the industrial-arts program of some variety as well as several service courses in the field of drafting for geology majors, farm shop for the Range Animal Husbandry Department, and arts and crafts for elementary teachers in training.—*Victor J. Smith.*

JAMES T. GEARON

James T. Gearon, U. S. Office Head, Reports and Analysis Section of the Vocational Division, died of a heart attack in his office on the afternoon of December 23.

He was appointed in 1941 to the Vocational Division and at the time of his death prepared reports on schools receiving federal vocational education funds. A native of Lynn, Mass., Mr. Gearon was a teacher and principal in Massachusetts schools for more than 20 years. Burial took place in Lynn, Mass.

REYNOLDS FLETCHER JARVIS

Reynolds Fletcher Jarvis, former director of the Alabama School of Trades, Gadsden, died on November 7 after an extended illness. He was 67.

R. F., as he was familiarly known to those closest to him, was a pioneer in vocational education. For 20 years he was director of vocational education for the city of Birmingham, going to Gadsden as director of the Alabama School of Trades in 1939.

♦ Louis E. Below teaches in the Vancouver, Wash., school system.

♦ Richard Smock is the automotive instructor for St. Rita High School in Chicago. He also teaches driver education at the experimental high school on the campus of the University of Chicago.

♦ Ralph Betterly, formerly associate professor of industrial arts at The Stout Institute, Menominee, Wis., is now associate professor of mechanical engineering at Teck Institute of Northwestern University.

♦ Donald Iverson is teaching welding in Escanaba, Mich.

♦ Ole Victor Oleson is completing his 25th year as a member of the staff at Hutchins Intermediate School in Detroit, Mich.

♦ Reuben J. Schafer, head of the cabinetmaking department of the Minneapolis Vocational School, is working on his Ph.D. degree at the University of Minnesota.

♦ Donald E. Hansen is an educational specialist at Randolph Air Force Base in Texas.

♦ Many graduates of The Stout Institute, Menominee, Wis., are now with the Delta Power Tool Division of the Rockwell Mfg. Co. Among these are: T. H. Teppen ('50), Kansas City, Mo.; George A. Jensen ('50), Ft. Wayne, Ind.; Darwin C. Serra ('50), Denver, Colo.; Stanley Kendall ('50), Spokane, Wash.; Will Malone ('51), and L. Burmeister ('50), Chicago, Ill.; and Fred Plonsky (M.S. '51); Dallas, Tex.

♦ Wallace Hammerberg spent last summer as assistant director at a ranch camp in Jackson Hole, Wyo.

Mr. Hammerberg lives in Highland Park, Ill., where he teaches woodwork and drawing.

♦ Paul A. Luoma is teaching welding, related art, and metallurgy at Fordson High School at Dearborn, Mich. He also has an adult evening class in welding.

♦ Eryle Graper is in charge of proficiency measurement for the department of crafts and trades at Chanute Field. His job is to review all examinations to insure proper construction on test items. He is also responsible for implementing the U. S. Air Force standard scoring system in his department. This system is being done air force wide as a means of validating the Air Force Classification System. Mr. Graper's home is in Rantoul, Ill.

♦ Dr. William J. Micheels, professor of industrial education at the University of Minnesota, recently served as a member of the survey team studying the Army's Anti Aircraft and Guided Missiles School at Fort Bliss, Tex.

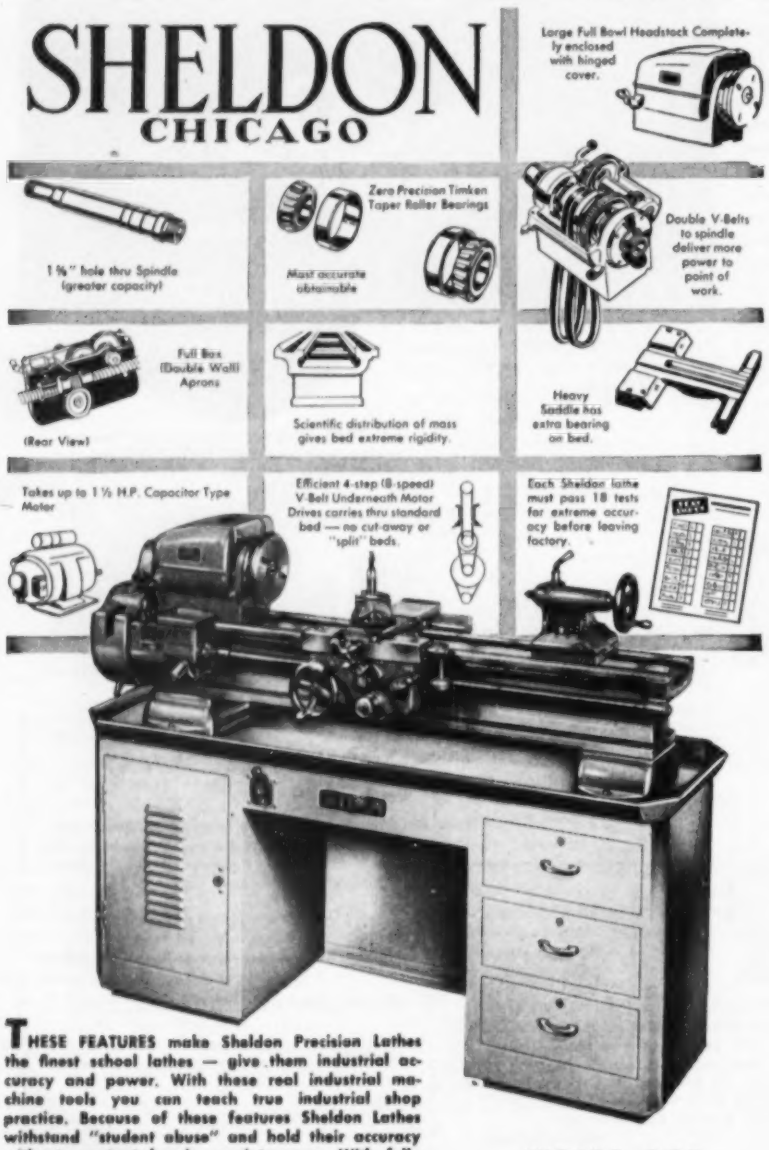
♦ Frank L. Dummann is secretary-treasurer of the Graphic Arts Young Executives Association. He is a member of the Board of Governors, the Milwaukee-Racine club of Printing House Craftsmen.

♦ Robert Burke teaches industrial arts in Chicago. He also coaches basketball and belongs to the Waukegan Township Physical Directors' Association. He served as president of this organization during 1950–51.

♦ Dr. Gerald B. Leighbody of Buffalo, N. Y., has been appointed to take over as assistant commissioner for vocational education in the State Education Department. The assignment was effective July 15. He has been professor of industrial education and supervisor of industrial teacher training in the Buffalo office of the Education Department.

(Continued on page 22A)

SHELDON
CHICAGO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—says Mr. Morris Taylor, Vocational Education Instructor, Jefferson High School, Charlottesville, Virginia

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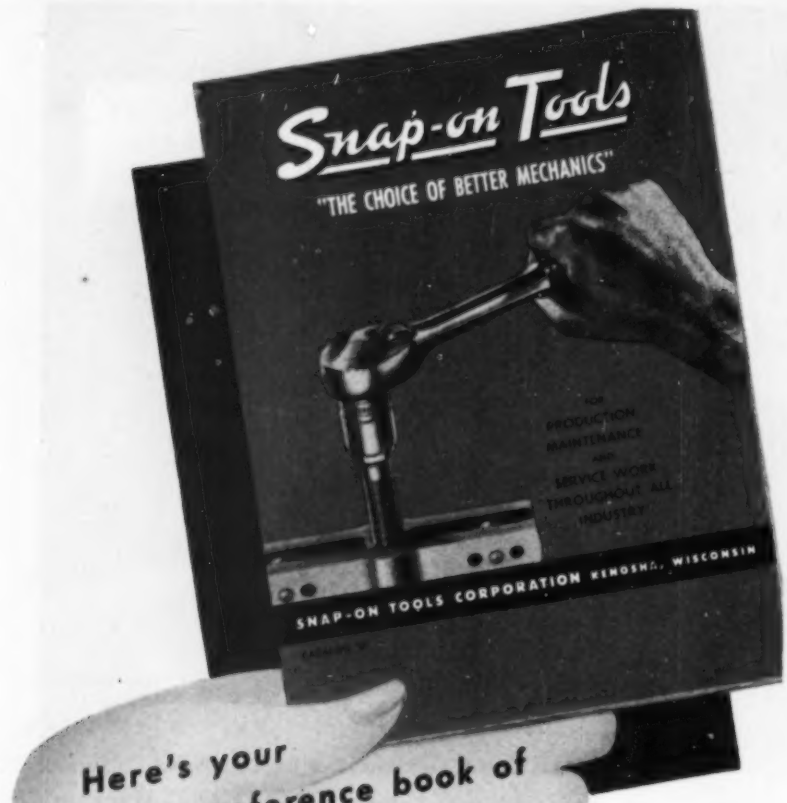
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PERSONAL NEWS

(Continued from page 20A)

Dr. Leighbody was appointed to succeed Dr. Arthur K. Getman, who retired last December.

♦ J. J. KAVETAN, director of Phoenix Technical School, Phoenix, Ariz., and a veteran of twenty years' service in the Phoenix Union System, has been named consultant in industrial education for the Phoenix Secondary Schools.

The new assignment will carry the responsibility of co-ordinating the more than 100 industrial-arts shops in the system high schools and Phoenix Technical School with the needs of students and industry. A vocational aptitude testing program will be inaugurated which will insure students with marked ability to learn vocational subjects an opportunity to attend the Technical School.

♦ DR. JOHN P. MASENGILL, who received his doctor of education degree from Bradley University in August, 1951, has joined the faculty of the Florida State University as a member of the industrial-arts department.

♦ CLYDE E. BURNS, director of industrial-arts education at Florida State University, received his doctor of education degree from that institution at the June commencement, 1952. His dissertation topic was "A Study of the Use of the Problem-Solving Approach in Industrial-Arts Programs in Florida Secondary Schools."

♦ TROY CUMMING, instructor of industrial arts in Leon High School, Tallahassee, Fla., received his master of science degree with a major in industrial arts from Florida State University at the June, 1952, commencement. This was the first master's degree in industrial arts granted by this school.

♦ Diedrich L. Dalke, instructor of industrial arts at Claude A. Swanson Junior High School, Arlington, Va., for the past seven years, has closed a long and illustrious career in the educational field.

Mr. Dalke served eleven years as city superintendent of schools in St. Marys, Kans.; Horton, Kans.; Portis, Kans.; and Rockport, Mo. He spent nine years as professor of education, department head and dean of Missouri Wesleyan College; two years as professor of education and German at Baker University; and seven years as educational adviser in the Civilian Conservation Corps.

He came to Washington, D. C., in 1942 to work for the Department of Agriculture. He entered the Arlington County School System in 1945 as industrial-arts instructor at Swanson Junior High School, his present position.

He holds an A.B. degree from McPherson College, McPherson, Kans.; an M.A. degree from the University of Kansas; and has attended the University of Missouri, Kansas State Teachers College, Pittsburg, Kans., and Bemidji State Teachers College, Bemidji, Minn.

Mr. Dalke will be missed by a host of fellow teachers in Arlington who realize the county is losing a real person as well as an outstanding educator. — *Donald Peters*

♦ FRANK M. HRACHOVSKY, assistant professor of technical drawing at Illinois Institute of Technology, has been promoted to the rank of associate professor, effective September 1.

Illinois Tech is the only educational institution in the United States which offers a regular curriculum leading to a degree in technical drawing.

♦ RAY KUIPERS is now employed by Kaiser-Fraser in their training program.

News Notes

♦ A 12-page catalogue of "Educational Aids for Power Supplier Rural Programs" is available from the Westinghouse Electric Corporation. Described in the catalogue are 38 free and low-cost materials for power suppliers to use in furthering 4-H, Future Farmers of America, Future Homemakers of America, and other rural educational programs.

For a copy of the catalogue, B-5864, write *School Service, Department T, Westinghouse Electric Corporation, Box 2278, Pittsburgh 30, Pa.*

♦ An improved, all-purpose version of its "1200" flux compound is announced by The American Platinum Works, Newark 5, N. J., for use in silver brazing operations.

This flux consists of a mixture of fluoride and borate salts, and melts at a temperature lower than the alloys employed and forms a coating of fused salts over the brazing area. It comes in the form of a smooth paste, which may be easily removed after brazing by washing with water.

♦ The first awarding of a new Durametallic Corporation scholarship to a junior or senior student in the vocational, industrial, and technical education department at Western Michigan College, Kalamazoo, Mich., has just been completed.

Robert Strayer, a senior who will graduate in June, won the first elimination and will receive $250 for the second semester of this school year. The award annually totals $500 and will be given each semester by the Kalamazoo firm.

In addition to going to school, Strayer also is employed part time by the J. A. Richard Company in Kalamazoo.

R. D. Hall, president of the Durametallic Corp., Dr. Joseph Giachino, head of the vocational department at Western, and three members of the faculty made the final selection.

♦ Forty high school seniors — 9 girls and 31 boys — were selected recently as the nation's most promising future scientists. Chosen from 2264 entrants from all 48 states and the District of Columbia, the 40 finalists in the twelfth annual Science Talent Search were awarded all-expense trips to Washington, D. C., and a chance to compete for $11,000 in Westinghouse science scholarships.

The finalists come from 19 states in all sections of the country.

♦ Participation by America's young craftsmen in Ford Motor Company's national 1952 Industrial Arts Awards competition increased 115 per cent over 1951, Mott B. Heath, manager of Ford's Community Relations Department, announced.

The big increase led I.A.A. officials to predict even more participation for the year 1952–53.

Junior and senior high school students sent more than 5100 entries this year for judging in July at the Henry Ford Museum in Greenfield Village, Dearborn, Mich. Last year entries totaled 2365. This year, for the first time since Ford took over the I.A.A. program from *Scholastic* magazine in 1950, every state was represented, along with three U. S. territories.

California led both in number of entries (977) and number of prize awards (279). Youngsters from the Golden State won 133 cash awards and 146 place recognitions.

Pennsylvania had 574 entries, and 109 awards.

(Continued on next page)

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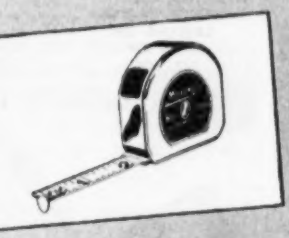

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NEWS NOTES

(Continued from previous page)

Illinois had 516 entries and 155 awards. Ohio had 397 entries and 115 awards.

Michigan contributed 326 entries for 96 awards, New York had 290 entries for 76 awards, and New Jersey had 261 entries for 49 awards.

Other states sending more than 100 entries were Missouri, Connecticut, Arizona, Texas, and Indiana.

Ford gave a total of $45,000 in prizes for the 1952 Industrial Arts Award program.

♦ Readers having copies of *How to Recognize Type Faces*, by R. Randolph Karch, may get two additional pages showing 14 new faces to add to their books (already showing 1475) by writing to McKnight & McKnight Publishing Company, Bloomington, Ill. The supplement is free. The book was reviewed in this magazine in November, 1952.

♦ The Fisher Body Division of General Motors has produced a new full-color Guild motion picture, "Youth Goes Creative."

It is designed for boys 12 through 19, and describes their opportunities to win $1,000 to $4,000 scholarships by competing in the Fisher Body Craftsman Guild's model car competition.

Featured in the film is a youth who actually won a $4,000 scholarship in Guild competition.

Running time, 17 minutes.

For further information write to Fisher Body Craftsman's Guild, General Motors Bldg., Detroit 2, Mich.

♦ A new Examiner's Manual for the Personal Form of the Kuder Preference Record is available by writing to Science Research Associates, Chicago 10.

The new revision explains the change of title for each of the five scales measured by this form of the Kuder records. Test items have not changed, but extensive research has shown that the original category titles failed to express all that the scales measured.

Incorporated in the new Manual are men/women norms based on over 1500 adults' test scores; reports of validity studies on the relationship between preferences and job satisfaction; profiles of satisfied workers in fifty different jobs; and profiles of satisfied and dissatisfied men and women in eight different occupations.

As a measure of non-preoccupational elements present in every job situation, the Kuder Personal Form is an excellent supplement to the Kuder Vocational Form which determines individual preferences in ten broad occupational areas.

Qualified educators and administrators may obtain copies of the newly revised Manual. Write: Sales Service Department, *Science Research Associates, Chicago 10, Ill.*

♦ A revised edition of the Thurstone Test of Mental Alertness has been announced by Science Research Associates. The test is available in a new format with reusable booklets and self-scoring answer pads. New items have been added, increasing the difficulty of the test, to provide finer discrimination among those who score in the top 10 per cent.

The revised Manual has norms obtained from high school pupils, business executives, sales supervisors, retail sales personnel, stockmen and clerical workers, and applicants for clerical positions.

Qualified educators and test administrators may obtain a specimen set of this test by writing the Information Department at *Science Research Associates, 57 West Grand Avenue, Chicago 10, Ill.*

♦ A program of scholarship awards for the sons and daughters of employees has been announced today by Handy & Harman, refiners, and fabricators of precious metals and their alloys, 82 Fulton St., New York 38, N. Y.

Winners of scholarships may keep them for a period of up to four years, with a maximum of $1,000 a year for each individual.

The awards will apply to a college or university, and also to any accredited, advanced educational institution, such as a trade or vocational school, conservatory of music, art or technical school. They will cover full tuition fees and up to three quarters of living costs and other essential expenses. The winners will be expected to earn a part of their expenses.

♦ American Forest Products Industries, Inc., has removed its office from 1319 Eighteenth Street Northwest, to 1816 N Street Northwest, Washington 6, D. C.

♦ Three men were the first summer school candidates to be graduated in a new major in administration and supervision of vocational education from Colorado A. & M. College in August, 1952. The names of these men graduating with an M.Ed. degree were: Jack Roland Anderson, supervisor and co-ordinator, Phoenix Technical School; Orvel E. Olsen, director, Antigo School of Vocational and Adult Education, Antigo, Wis.; and Theodore A. Thomas, formerly T. & I. co-ordinator, Edgemont, S. Dak. Mr. Anderson's master's report was entitled, "Trade and Industrial Education Program of the Phoenix Technical

(Continued on page 26A)

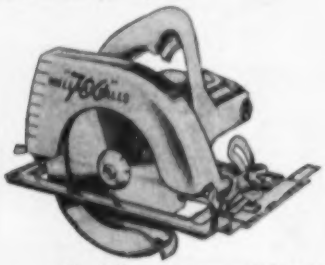
There's Power to Spare

in these outstanding Millers Falls electric tools

In an electric tool, it's power that counts. And that's just what you get in these latest additions to Millers Falls power-packed utility line. Feature by feature — each is an eye-opener for value — designed and built to outperform any comparable tools on the market today.

No. 1814
NEW ¼" PISTOL-GRIP DRILL

The biggest ¼" drill value ever offered. Light yet rugged, streamlined yet powerful. Also operates grinding, buffing and wire brush wheels, sanding discs and polishing bonnets.



No. 700
EASIER, FASTER SAWING ON 90% OF ALL JOBS

Powerful, compact, safe — the biggest buy in saws today. 7" blade; 2⅜" capacity; cuts finished 2x4's at 45° mitre.

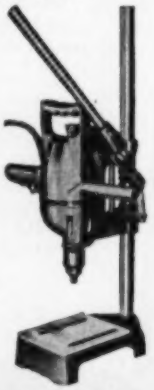
With abrasive discs, cuts metals, concrete, tile. Also available: Heavy-Duty No. 850 9" and No. 1050 10" saws.

No. 966
Sander-Polisher
MOST VERSATILE TOOL IN ITS FIELD

Capable of handling practically every type of work. It buffs, sands, grinds, polishes, waxes, wire brushes, drills, mixes paints. And it's the only disc sander-polisher with an orbital attachment for fine-finish work. Versatility *plus!*

No. 912
MOST POWERFUL ½" UTILITY DRILL MADE

Weighs only 8 lbs., but packs more power than any comparable drill made. Capacity: ½" in steel, ¾" in hard wood. With Jacobs Geared Key Chuck.



No. 2912
RUGGED VERTICAL AND HORIZONTAL STANDS

For high-accuracy drilling, Millers Falls offers sturdily constructed vertical bench stands. (No. 2912 for ½" drill shown at right.) In addition, a horizontal bench stand and many other accessories are available to multiply the usefulness of Millers Falls ¼" drills.

Write for literature and full information on Millers Falls broad line of high-performance utility and industrial electric tools.

MILLERS FALLS COMPANY
Greenfield, Mass.

MILLERS FALLS TOOLS
SINCE 1868
The Mark of Superiority

How many extra shops can your school use?

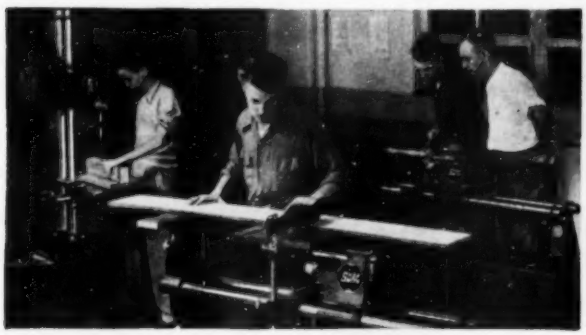
A shop for beginners . . . and one for advanced students. A shop for teaching lathe work . . . another for teaching drill press operation. A shop with circular saws to spare . . . a shop with enough disc sanders to meet the most abnormal demand.

Your school can have these different shops—and many more besides—*all for the price of one!* Fact is, with the *Flexible Shop*, even the smallest school can have a variety of power tool equipment never before possible.

Key to the *Flexible Shop* is SHOPSMITH! This versatile power tool can be changed quickly and easily from an 8-inch circular saw to a 12-inch disc sander to a 33-inch lathe to a horizontal or a 15-inch vertical drill press. In a shop equipped with several SHOPSMITHS, there is virtually no limit to the power tool combinations it is possible to set up!

SHOPSMITH is a tool of exceptional quality and precision. In accuracy, capacity and all-around utility, it equals or surpasses the individual tools it replaces or supplements. In compactness and flexibility, it far exceeds all others. In safety and simplicity of operation, it has the approval of leading industrial arts instructors.

SHOPSMITH costs **$199.50** complete except for ½-hp. motor ($34.50) and special school guards ($8.45). Send coupon for booklets describing completely SHOPSMITH's application to industrial arts education!



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Dept. 235U, at factory nearest you:
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Menlo Park, Calif.

• Please send me complete information about the *Flexible Shop* and the application of SHOPSMITH to industrial arts education.

Name _____ *Position* _____

School _____

Address _____

City _____ *State* _____

NEWS NOTES

(Continued from page 24A)

School." Mr. Olsen made a study of "Proposed Adult Program of Vocational Agriculture for the Antigo Area," and Mr. Thomas presented a report on "Effect of Trade and Industrial Program on Student Withdrawals."

To be admitted as a candidate in the new major, students must furnish evidence of a minimum of three years of administrative or supervisory duties in programs of vocational education as certified by a state supervisor or state director.

The new major provides opportunities for supervisors and administrators to broaden their thinking in terms of adult education, public relations, labor relations, diversified occupations, guidance, and others, and gives supervisors and administrators techniques in the handling of these special areas. — *Robert S. Hunter.*

♦ *"ARC WELDING"* is the name of an all-new, full-color filmstrip series sure to be of particular interest to industrial, vocational, and apprenticeship training educators. Prepared by Audio-Visual Division of Popular Science Pub. Co., 353–4th Ave., New York City, in co-operation with the Lincoln Electric Company, this exceptional series offers authentic, completely up-to-date coverage of a subject of first importance to America's industry.

Additional information about "Arc Welding" full-color filmstrip series of three great titles is obtainable from your local audio-visual dealer or from the Audio-Visual Division of Popular Science Publishing Co., New York City.

♦ The Institute for Economic Education provided Detroit parochial school drafting classes 28 separate plant visits during the fall term.

At the recommendation of Don Zwickey, supervisor of drafting in the parochial schools, each plant visit consists of three closely related parts. First is the drafting room, where the machine tools of the specific industry are designed. Second, the department in which the toolmakers work. Third, the production area where the machine tools are seen in operation.

Preliminary to each visit, the boys were given outlines of the history of the industry, its products, its relationship to other industry, and its various responsibilities.

Plans are being made to include Detroit's outlying areas in the plant-visit program of the spring term.

Instructor observes wave forms with viewing attachment before making oscillogram

Low-cost portable oscillograph designed for school applications

EXTREME SIMPLICITY of operation and low cost are two features which make General Electric's new PM-18 oscillograph popular with technical and engineering schools.

FLEXIBILITY is assured in the design of the PM-18 oscillograph. Features include a variety of high-sensitivity galvanometers and adjustable time sweep of 0.1 to 0.5 seconds.

Complete with film-pack holder and film, the PM-18 may also be ordered with either a film holder using Polaroid-Land film or a continuous-drive film holder. For further information contact your nearest G-E Apparatus Sales Office, or write for Bulletin GEC-580 to General Electric Co., Section 687-125F, Schenectady 5, N. Y.

YOUR COPY of this 16-page bulletin, GEA-5526, containing information on the specially designed G-E Educational Equipment for electrical laboratories is available on request.

You can put your confidence in—

GENERAL ELECTRIC

New Publications

Beginning Electricity

By J. R. Eaton. Cloth, 365 pp., 6⅛ by 9¼ in., illus., $5.50. The Macmillan Company, New York City.

This book on electricity is designed to give the beginner a good grasp of the theory of electricity and an understanding of the working of electrical equipment.

The first 13 chapters explain the basic ideas underlying the subject. Then direct-current applications are discussed in the next nine chapters.

Alternating-current applications are made plain in the following five chapters after which electronics, measurements, and communications are entered into.

28 Table Lamp Projects

By H. A. Menke. Cloth, 78 pp., 6 by 9¼ in., illus., $2.50. McKnight & McKnight Publishing Co., Bloomington, Ill.

Students in the woodwork shop, or the handcrafter in the home shop will find some good suggestions for making lamps for use about the home in this book. There are 28 to choose from and each project is well illustrated with line cuts and half tones.

Color in Business, Science, and Industry

By Deane B. Judd. Cloth, 401 pp., 6⅛ by 9¼ in., illus., $6.50. John Wiley & Sons, Inc., New York City.

A book which attempts to clarify the subject of psychophysics of color in terms that the layman can understand.

The three parts of the book present the basic facts by discussing the eye, aspects of color, color matching, and color deficiencies.

Part II discusses the required tools and the techniques used in judging colors.

Part III presents the physics and psychophysics of colorant layers.

All About Upholstering

By John Bergen. Cloth, 224 pp., 6½ by 9⅛ in., illus., $3.50. Popular Mechanics Press, Chicago, Ill.

The author of this book is a commercial furniture designer. His instructions are given in clear and understandable terms, and there are hundreds of fine illustrations.

(Continued on page 28A)

Projects in Metalworking

Written by
DONALD G. LUX
Instructor, Division of Industrial Education
**State University*

NEW 32 PAGE BOOK contains 12 projects to aid the Metalworking Instructor!

DI-ACRO BENDER NO. 1

DI-ACRO FINGER BRAKE

DI-ACRO ROLLER

This booklet is designed to illustrate projects which include in their construction common metalworking operations that are readily performed on the Di-Acro Machines best adapted for use in the school shop—Rollers, Brakes and Benders.

These Di-Acro Machines are versatile, are made in sizes which are suitable for the small school shop, and are of sound construction which should appeal to school shop instructors and supervisors. Complete information on Di-Acro Rollers, Brakes and Benders is contained in the booklet.

*Name on request.

TO THE INSTRUCTOR OR SUPERVISOR
A copy of the PROJECTS IN METALWORKING booklet is available to you free of charge. Request it on your school letterhead. Copies in classroom lots—25¢ each.

DI-ACRO is pronounced Die-ack-ro
It is the registered brand name for the more than 40 hand and power operated Di-Acro Benders, Brakes, Notchers, Punch Presses, Rod Parters, Rollers and Shears made in U.S.A. by

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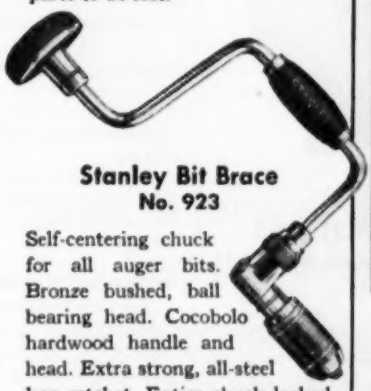
Stanley Bit Gauge
No. 47

Will not mar surface—the flexible spring bends if boring continues beyond desired depth. Fully adjustable clamp fits all auger bit sizes from 3/16" to 16/16". Spring easily adjusted to exact hole depth required. Extra turn of clamping nut locks all parts in place—no parts to be lost.



Stanley Bit Brace
No. 923

Self-centering chuck for all auger bits. Bronze bushed, ball bearing head. Cocobolo hardwood handle and head. Extra strong, all-steel box ratchet. Entire chuck locked in place. Forged Universal jaws hold all sizes auger bits and drills from ⅛" to ½". Made in 5 sizes —6" to 14" sweep.

No. 100
Russell Jennings
Auger Bits

Forged from finest high carbon steel. Extension lip and spurs accurately hand filed for smooth cutting. Available in complete range of sizes—from 3/16" up.

Order these top quality Stanley Boring Tools for your school shop now. Like all Stanley Tools, they're designed for speed and accuracy, made to stand the strain of constant use. Add them to your next tool requisition—get the most for your tool dollar. Stanley Tools, Educational Dept., 104 Elm St., New Britain, Conn.

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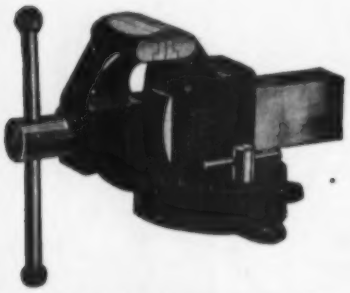
Continuous screw with stop in front jaw. Made of semi-steel castings, it is fully machined.



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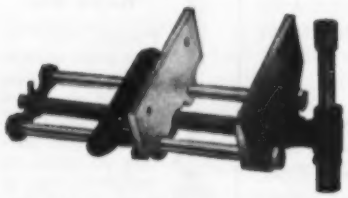
Solid Jaw and Swivel Base

Special semi-steel casting and accurate milling of the sliding bar characterize both the Stationary Base and Swivel base vises. New, improved base on the swivel type vise.



QUICK ACTION VISE

This simplest and most effective of screw adjusting types is carefully machined and finished, with nothing to get out of order.

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MORGAN VISE CO.

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Chicago 6, Illinois

NEW PUBLICATIONS

(Continued from page 26A)

The step-by-step instructions are followed readily and students, homecraftsmen, and apprentices will find the book very helpful.

Besides the upholstery processes the book explains about repairing, restyling, and making slip covers.

Band Tool Manual

Paper, 160 pp., 6 by 9 in., illus., $2. The DoAll Company, Des Plaines, Ill.

This manual gives machine operators, students, and production planning engineers a comprehensive explanation of all band tools used in sawing, slicing, filing, grinding, and polishing operations.

Photographs and drawings are used throughout to define band tool terminology, the 16 kinds of band tools, and their application to the machining of materials.

Conventional low-speed band machining, friction sawing, line grinding, band filing, and cutting of vitreous materials with diamond tooth blades are a few of the many applications shown for band machining.

A series of 82 band tool selection charts also is contained in the manual.

Manual of Instruction for Assembling Electric Motors

Paper, 28 pp., 6 by 8⅝ in., illus. Published by Electric Motor Craft, 115 Croydon Court, Silver Spring, Md.

This manual gives explicit directions on how to assemble ⅛, ⅙, ¼, and ⅓ h.p., split-phase motors.

These motors can be obtained in the form of kits, and actual experience may thus be gained in the assembling of these useful fractional h.p. motors.

Suggested Standards for Automotive Service Instruction in Schools

Paper, 60 pp., 8½ by 11 in., illus. Published through the courtesy of the Ford Motor Co., Dearborn, Mich., by AI-VE Conference on Public School Automotive Instruction, 320 New Center Bldg., Detroit 2, Mich.

These standards were set up by the Automotive Industry-Vocational Education Conference on Public School Automotive Instruction.

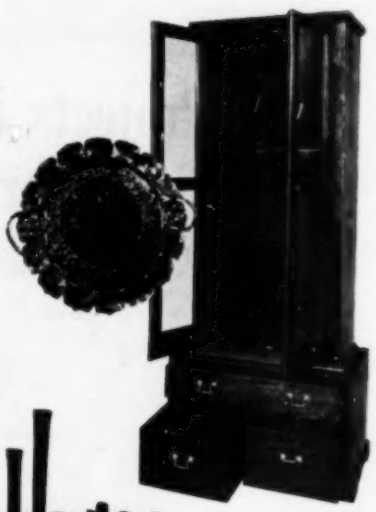
In the seven sections into which the book is divided, are discussed the selection of students, the opportunities offered by the automobile service industry, the curriculum, supplies and equipment needed, suggestive shop and building layouts, a teacher training program, and summer institutes.

Kodak Data Book on Slides

Paper, 49 pp., 5¾ by 8½ in., illus., 50 cents. Eastman Kodak Co., Rochester 4, N. Y.

This booklet has just been revised and brought up to date. It includes the latest recommendations and data on films, cameras, projectors recommended for slide making. The data book is intended to provide a comprehensive and understandable reference manual for all photographic workers who are interested in producing their own slides. It details, step by step, the necessary equipment and materials needed for the production of top quality slides and provides data on various techniques of slide production.

(Continued on page 31A)



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Top projects now being made by your students may very well be winners! Outstanding Achievement award-winning students and their teachers will be brought to Detroit by Ford Motor Company—for three days in the world's industrial capital. There they will visit many points of interest, and be honored at the Annual Awards Dinner. I.A.A. credits craftsmen in an interesting, exciting way! But hurry, because . . .

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Severe winters on the Italian front forced Ed Reep to turn to pen and ink. "Oils were not practical," he recalls, "because of slowness in drying, and watercolors actually froze on the board, only to melt away later. Ink worked! Yes, it was Higgins!"

In the masterly light and shade gradations of "Mortarmen," Reep uses this versatile medium for a full scale of values from pure white to solid black – and all the tones between.

But Higgins' versatility is nothing new to Reep. "Since art school days," he says, "I have used colored and black and white Higgins Drawing Ink, hardly considering the fact that there might be other brands on the market. Strong testimonial, but *true!*"

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Specialists in Electronic Supply for Schools

NEW PUBLICATIONS

(Continued from page 28A)

Sources of Information in the American Graphic Arts

By George J. Mills. Paper cover, spiral binding, 70 pp., 6⅛ by 9⅛ in., $2. Carnegie Press, Carnegie Institute of Technology, Pittsburgh, Pa.

A book that attempts to answer the numerous questions asked by persons in all phases of the graphic arts.

It presents bibliographies of books, periodicals, and directories, and then lists a rather comprehensive schedule of sources where information may be gained.

Dictionary of Civics and Government

By Marjorie Tallman. Cloth, 291 pp., 6⅛ by 9⅛ in., $5. The Philosophical Library, New York, N. Y.

A fine collection of civic and political terms with definitions so that voters may understand the language in which the ever increasing political questions are couched.

If the citizen is to arrive at the right solution of the questions which confront our democracy today, he must know the exact meaning of the words used in describing the public issues.

This book will be a great help in this direction.

Education of Veterans in Farming

AVA Research Bulletin Number 5. Paper cover, 96 pp., 6 by 9 in., 75 cents.

This is the first nationwide report on the extensive program of agricultural education carried on under the provisions of the G.I. Bill. It includes all important features of the institutional-on-farm training program, covering 5274 self-employed veterans, in 42 states, a 1.9 sampling of the veterans enrolled in the training programs in these states in 1950.

The study was conducted and the report prepared by a special Committee on Research in the Education of Farm Veterans, composed of members of the Agricultural Education Division of the AVA.

Our World of Work

By Seymour L. Wolfbein and Harold Goldstein. Paper, 49 pp., 5½ by 8½ in., illus., 40 cents. Science Research Associates, Inc., 57 West Grand Ave., Chicago 10, Ill.

This booklet is one belonging to the Life Adjustment Series. It is written for the youngsters looking for jobs. It shows how the world of work has changed in the past fifty years, and shows what is expected of the worker today.

Facts About Juvenile Delinquency

By Ruth Strang. Paper, 49 pp., 5½ by 8½ in., illus., 40 cents. Science Research Associates, Inc., 57 West Grand Ave., Chicago 10, Ill.

This booklet is one of the Life Adjustment Series.

The increase of juvenile delinquency naturally brings up the question of what it is, who the delinquents are, and what has made them that way.

The question of what can be done to help delinquents also is discussed.

What Is Honesty?

By Thaddeus B. Clark. Paper, 49 pp., 5½ by 8½ in., illus., 40 cents. Science Research Associates, Inc., 57 West Grand Ave., Chicago 10, Ill.

A booklet belonging to the Life Adjustment Booklets.

An attempt to give the young an understanding of what "honest action" means.

Your Child and Radio, TV, Comics and Movies

By Paul Witty and Harry Bricker. Paper, 49 pp., 5½ by 8½ in., illus., 40 cents. Science Research Associates, Inc., 57 W. Grand Ave., Chicago 10, Ill.

This is one of the SRA Better Living Booklets.

A study of how these different forms of entertainment act upon our children, and what can be done to improve them so they have a better effect upon the youngsters.

When Children Start Dating

By Edith G. Neisser. Paper, 49 pp., 5½ by 8½ in., illus., 40 cents. Science Research Associates, Inc., 57 W. Grand Ave., Chicago 10, Ill.

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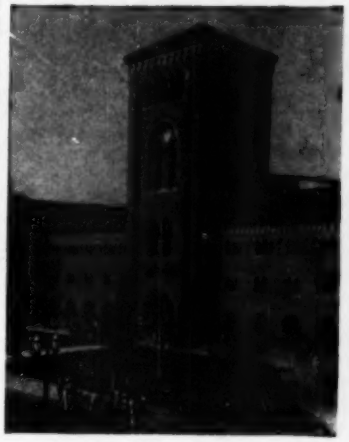

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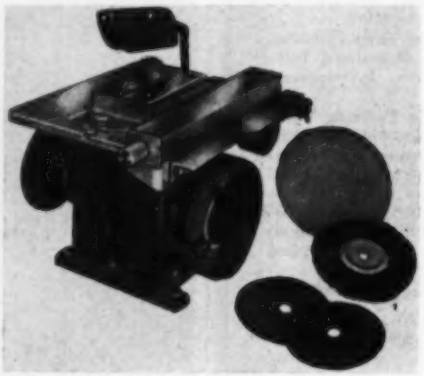

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For further information write to *Utica Drop Forge and Tool Corp., Utica 4, N. Y.*

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For further information write to *South Bend Lathe, South Bend 22, Ind.*

For brief reference use IAVE — 0403.

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(Continued on page 36A)

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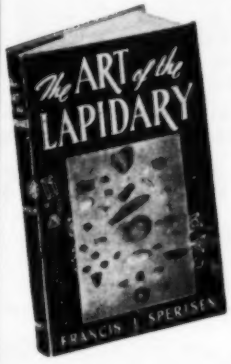

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SHOP EQUIPMENT NEWS

(Continued from page 34A)

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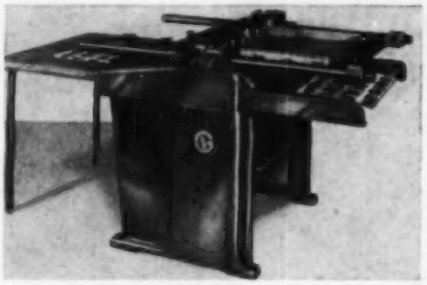
The new press was developed to meet the demand for high speed, precision silk screen printing of small size sheets required for greeting cards, decals, labels, catalog and menu covers, daylight



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For brief reference use IAVE—0404.

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(Continued on page 38A)

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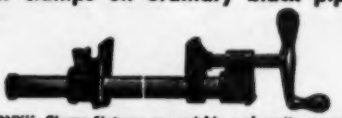

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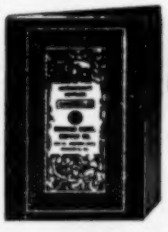

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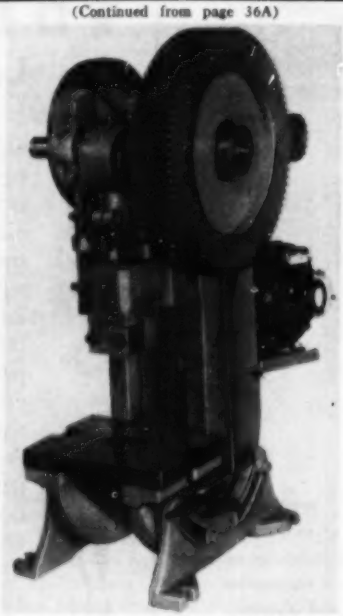
(Continued from page 36A)



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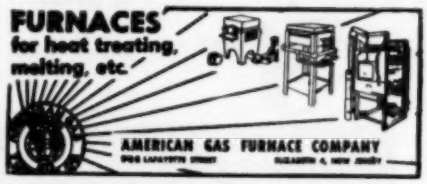

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April, 1953

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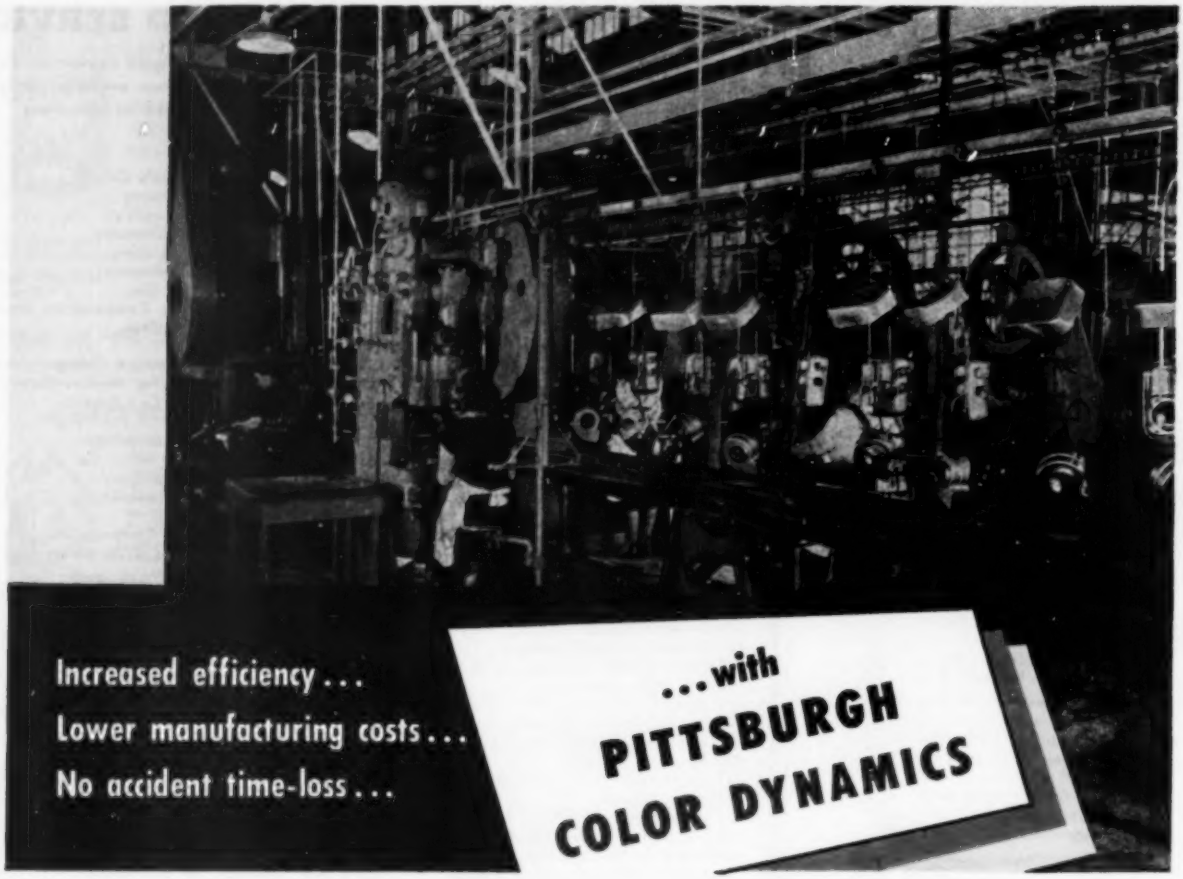

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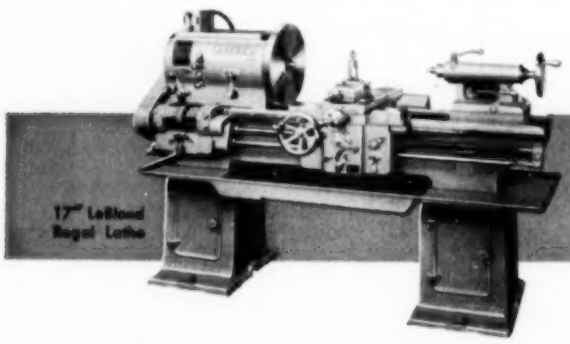

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